

Machine and Tool
**BLUE
BOOK**

JULY 1955



General Motors'
Chayne:
"Chief gas turbine
engine problem
... is fuel economy."



**A HITCHCOCK
PUBLICATION**

CONTENTS ON PAGES 5 and 6

Never Confuse the No. 8 MARVEL with an ordinary Band Saw ...only the MARVEL is Universal



Only a No. 8 MARVEL can do all of these things: Snip-off a $\frac{1}{8}$ " rod or cut-off an 18" x 18" cross section.



Rough to Size and Shape



Miller



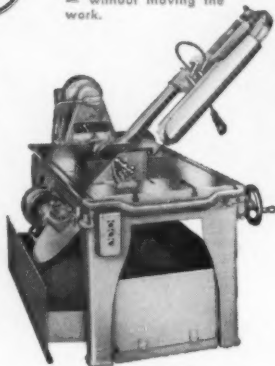
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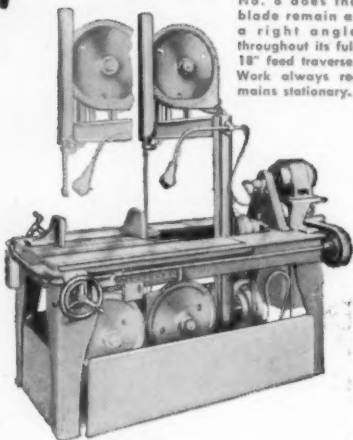
cut off and shroud Structural Beams



Only on a No. 8 MARVEL can the saw column be instantly indexed and locked at any angle from 45° right to 45° left, and the saw then fed thru the work at the desired angle — without moving the work.



Only on a MARVEL No. 8 does the blade remain at a right angle throughout its full 18" feed traverse. Work always remains stationary.



Only a No. 8 MARVEL has the large T-slotted work table, with removable quick action vise, that permits accurate set-ups of work of unrestricted sizes and shapes, special fixtures; Etc.

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The No. 8 MARVEL is the "busiest tool in the shop" wherever installed because it is a *universal* tool—has both the capacity and the versatility to handle not only standard sawing jobs but innumerable "trick" and convenience jobs as well. More than a metal saw, the No. 8 MARVEL is a fine machine tool with machine tool features like: Both power and hand feeds; Depth Stops; Automatic Blade Tension; Built-in Coolant Pump; Three operating speeds (or six with 2-speed motor). Moisture-proof electrical controls that conform to both "J.I.C." and "MACHINE TOOL" electrical standards; Dirt-proof ball bearings, etc.

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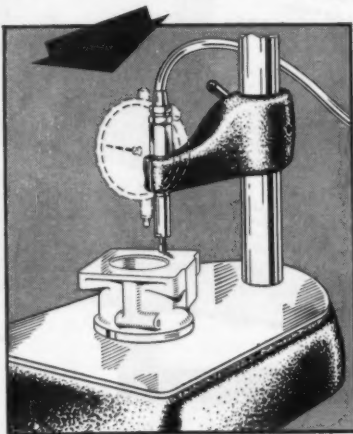


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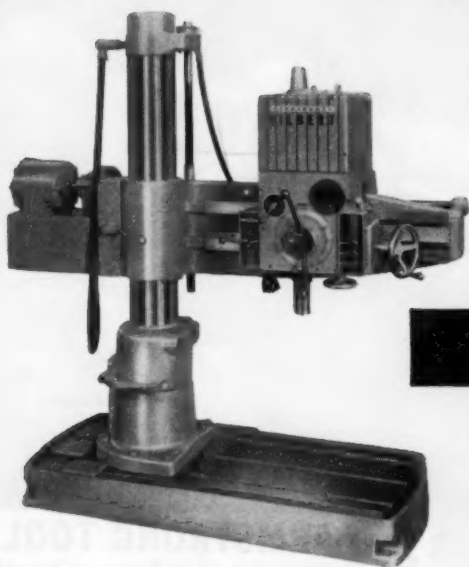


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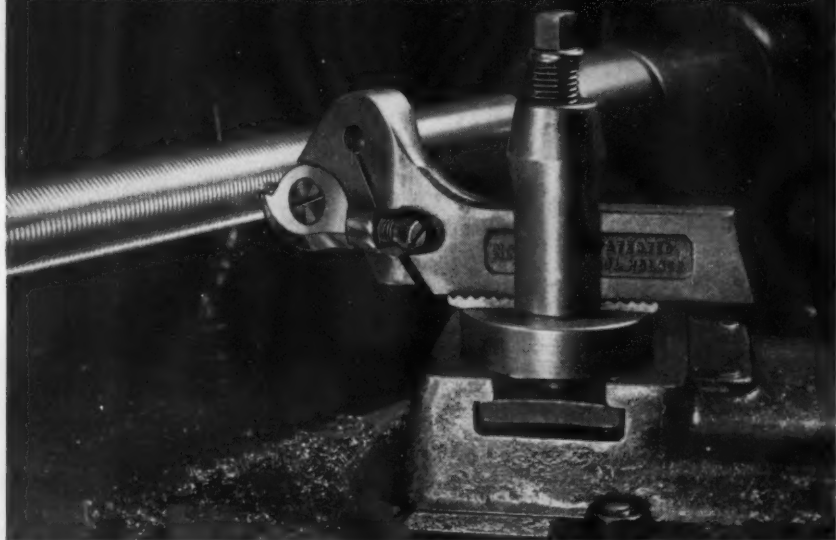
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MACHINE and TOOL BLUE BOOK



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MACHINE and TOOL BLUE BOOK

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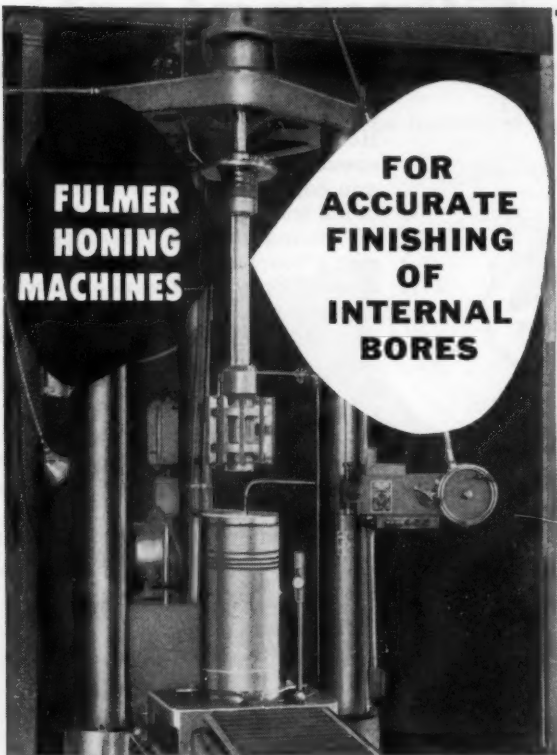
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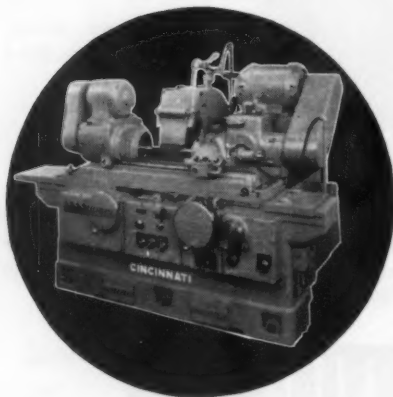
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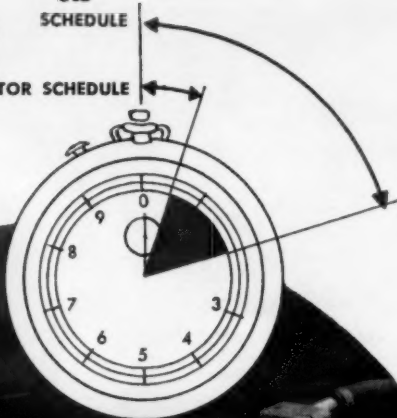
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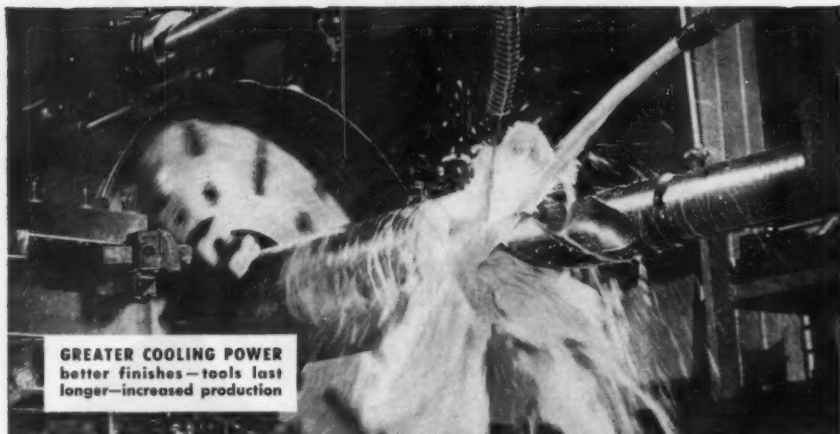


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July, 1955

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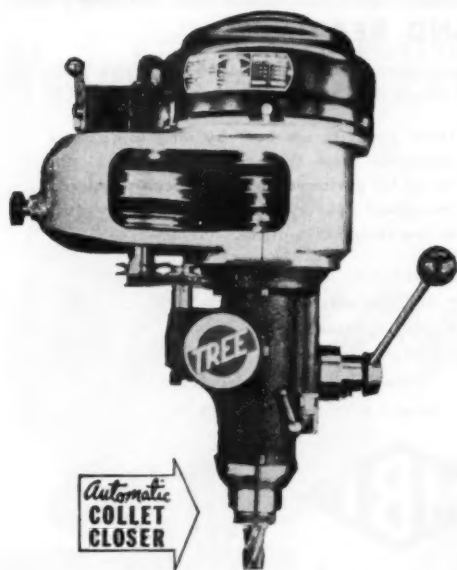


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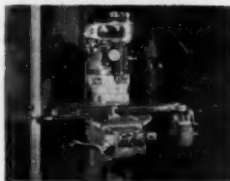
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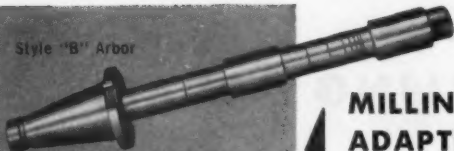
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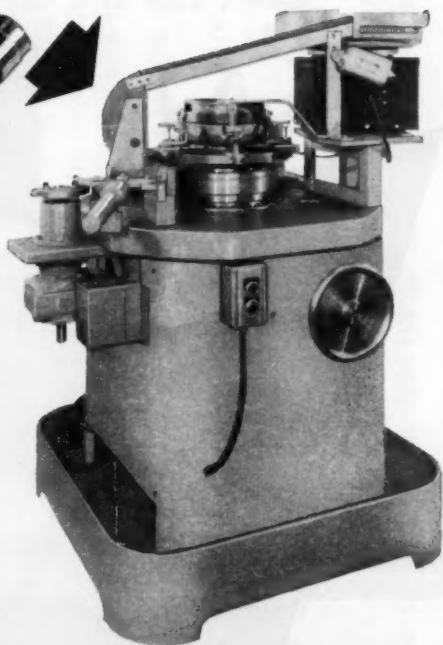
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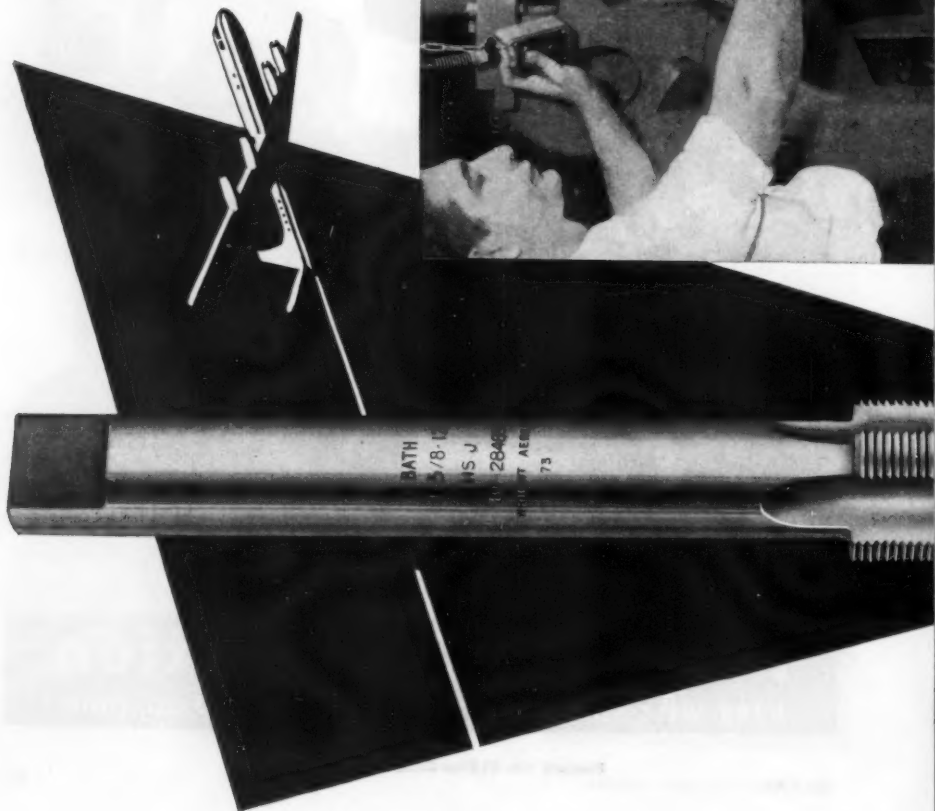
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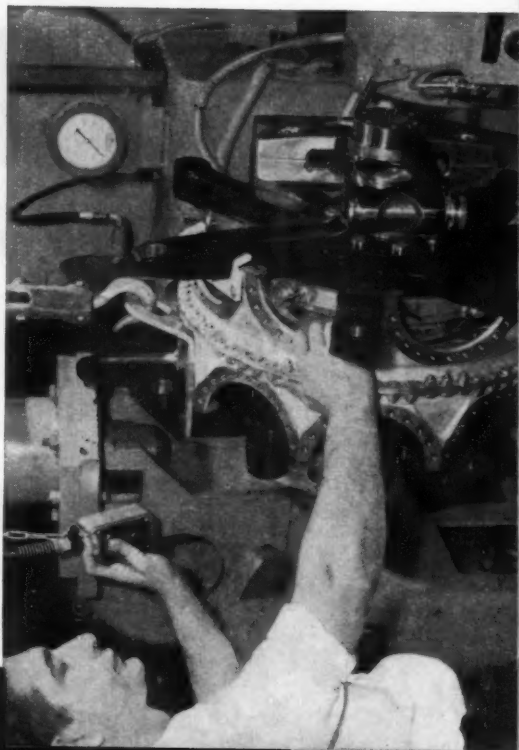
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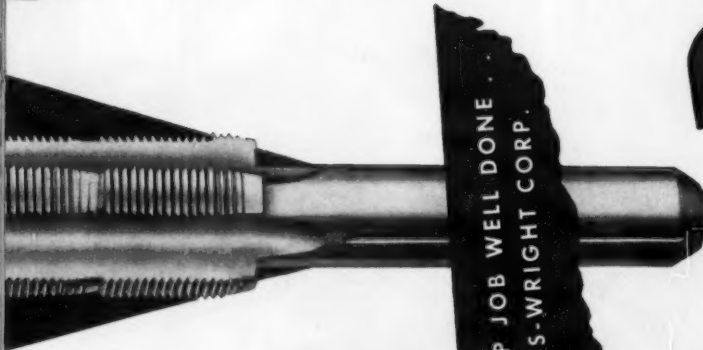
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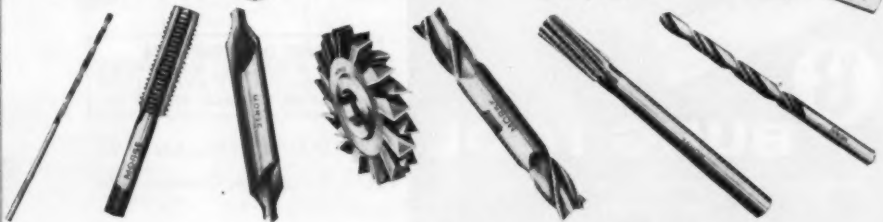
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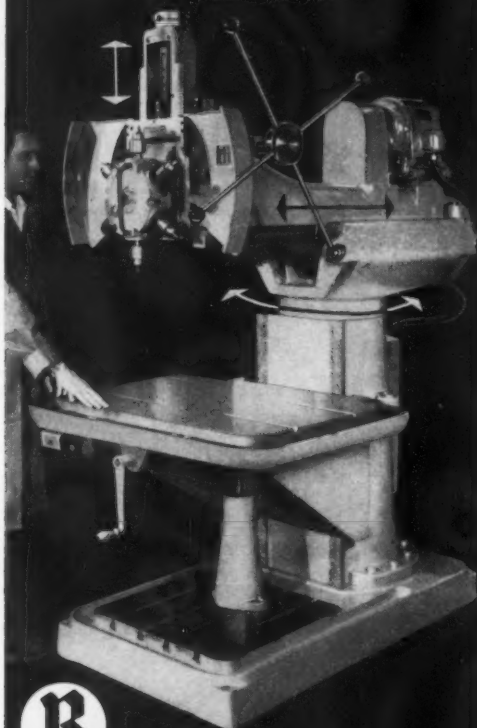
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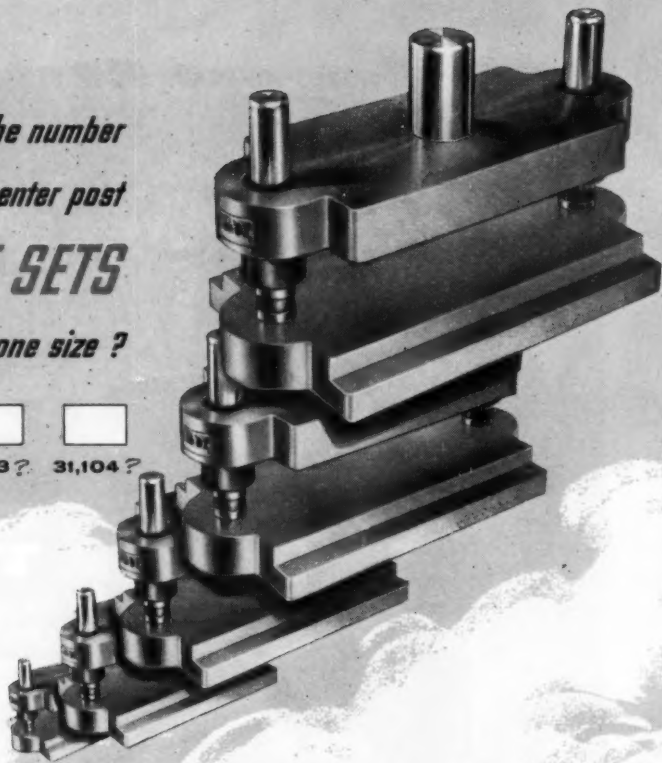
576 ?



1433 ?



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OPEN BACK • INCLINABLE *Power Presses*

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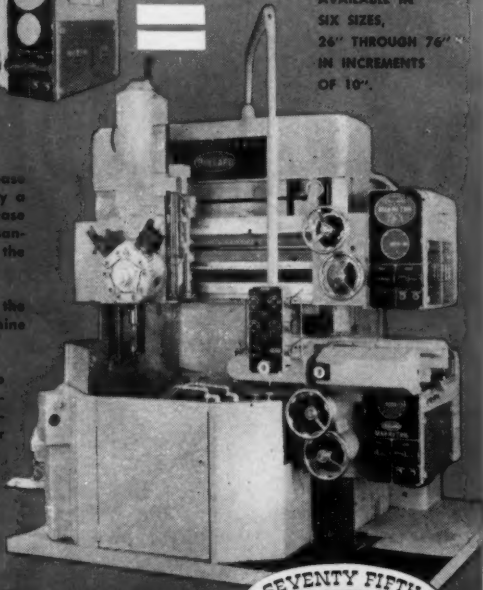
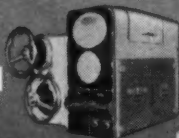
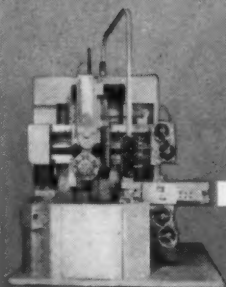
MACHINE and TOOL BLUE BOOK

Machine Tools for *Today*

and
Tomorrow!

The most versatile vertical turret lathe
available to the metalworking industry...

... **Man-Au-Trol, Model 75**



AVAILABLE IN
SIX SIZES,
24" THROUGH 76"
IN INCREMENTS
OF 10".

Versatile because at the time of purchase should your production output require only a Cut Master V.T.L., Model 75 and later increase so that automatic operation is desirable, a Man-Au-Trol Conversion Unit can be added to the Cut Master right in your plant.

The Man-Au-Trol Conversion Unit directs the machine through all the functions the machine is capable of performing — automatically.

Your Bullard Sales Engineer will be glad to fully explain all of the technological advantages that are incorporated in the Man-Au-Trol, Model 75 and apply them to your machining problems.



PLAN TO VISIT OUR
EXHIBIT AT
BOOTH 1213



WE INVITE YOUR INQUIRIES — CALL OR WRITE
YOUR NEAREST BULLARD SALES OFFICE, DISTRIBUTOR OR
THE BULLARD COMPANY
BRIDGEPORT 2, CONNECTICUT



LOOK TO THIS NEW, PRODUCTION-BOOSTING LINE



50 THROUGH 300-TON CAPACITIES



America's Most Complete Line of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

For a realistic answer to the metal stamping and forming problems of today... and tomorrow

DESIGN MODERNIZATION CONCEALS DRIVING MECHANISM

Fully streamlined, enclosed construction, front and back, provides pronounced advantages. There are no exposed, overhanging flywheel, clutch, brake, intermediate shaft, nor motor in rear of press to obstruct crane service, block light, throw grease and consume floor space unnecessarily... yet all parts are quickly accessible.

WORK-SAVING FLEXIBILITY MEETS SHIFTING PRODUCTION NEEDS

Box type welded steel slides are power adjusted through self-locking, worm driven, barrel type connections to accommodate a wide range of die heights and to permit quicker, easier and safer die setting. Niagara electric clutch control provides trouble-free push button operation and a five-position selector switch for ease, safety and efficiency in single stroking, continuous running, jogging, reverse jogging and slide adjustment.

RUGGED, HEAVY DUTY FRAMES PROLONG DIE LIFE

All-steel, rigidly constructed frames, featuring an exclusive triple box section design, provide maximum resistance to deflection from horizontal, diagonal and torsional stresses. Greater accuracy and longer die life are thereby assured.

GREAT SHUT HEIGHT AND LONG SLIDE ADJUSTMENT

Unusually liberal shut height and extremely long slide adjustment, of both one and four-piece frame construction, permit use of a tremendous range of stamping and forming dies.

Hailed as the most progressive step in straight side, double crank press history, the new Niagara SC-2 Press Series could only have originated from a keen insight of today's metal working problems and the more challenging ones of tomorrow. In every detail of design, you'll recognize the unduplicated competence of Niagara engineers. Who else would be more mindful of press users' needs than the men who design and build America's leading and most complete line of presses, press brakes, shears, other machines and tools for plate and sheet metal work?



CHECK THE FEATURE-BY-FEATURE EVIDENCE

Preview this complete new line of straight side presses at once. Find out what they can do for you. Write for Niagara's new, illustrated Bulletin 64-H today.

NIAGARA MACHINE & TOOL WORKS BUFFALO 11, N. Y.

DISTRICT OFFICES:

Detroit • Cleveland • New York • Philadelphia
Dealers in principal U. S. cities and major foreign countries

NIAGARA

STRAIGHT SIDE DOUBLE CRANK PRESSES



Every drill you grind on a
SELLERS Drill Grinder
cuts exactly like a new one!

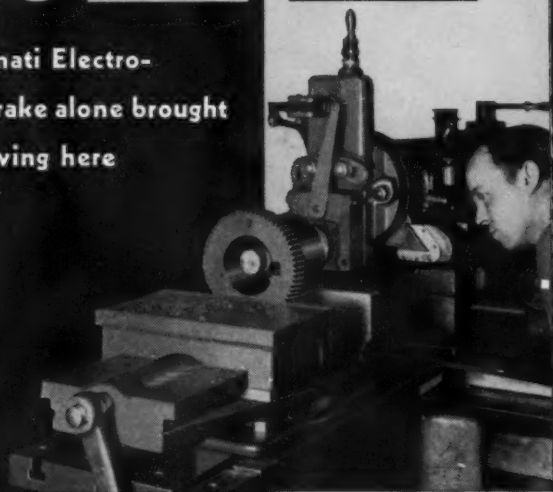


CONSOLIDATED MACHINE TOOL COMPANY
ROCHESTER, NEW YORK

A DIVISION OF FARREL-BIRMINGHAM COMPANY, INC.

Outstanding Time Saver..

The New Cincinnati Electro-
Magnetic Clutch and Brake alone brought
a 30% time-saving here



The New Cincinnati Magnetic Clutch and Brake, with its single, convenient control lever, gives the operator the fastest, simplest and most accurate control of his Shaper and converts waste time into productive time.

This powerful clutch and brake requires no adjustment, and has a long, maintenance-free life.

Write for Cincinnati Shaper Catalog N-6.

Shaping time on 7 internal oil grooves in these steel sleeves was reduced from 12.5 minutes to 8 minutes, by the Cincinnati Electro-Magnetic Clutch and Brake.



SEE
CINCINNATI
SHAPERS, SHEARS,
PRESS BRAKES
BOOTH 1105

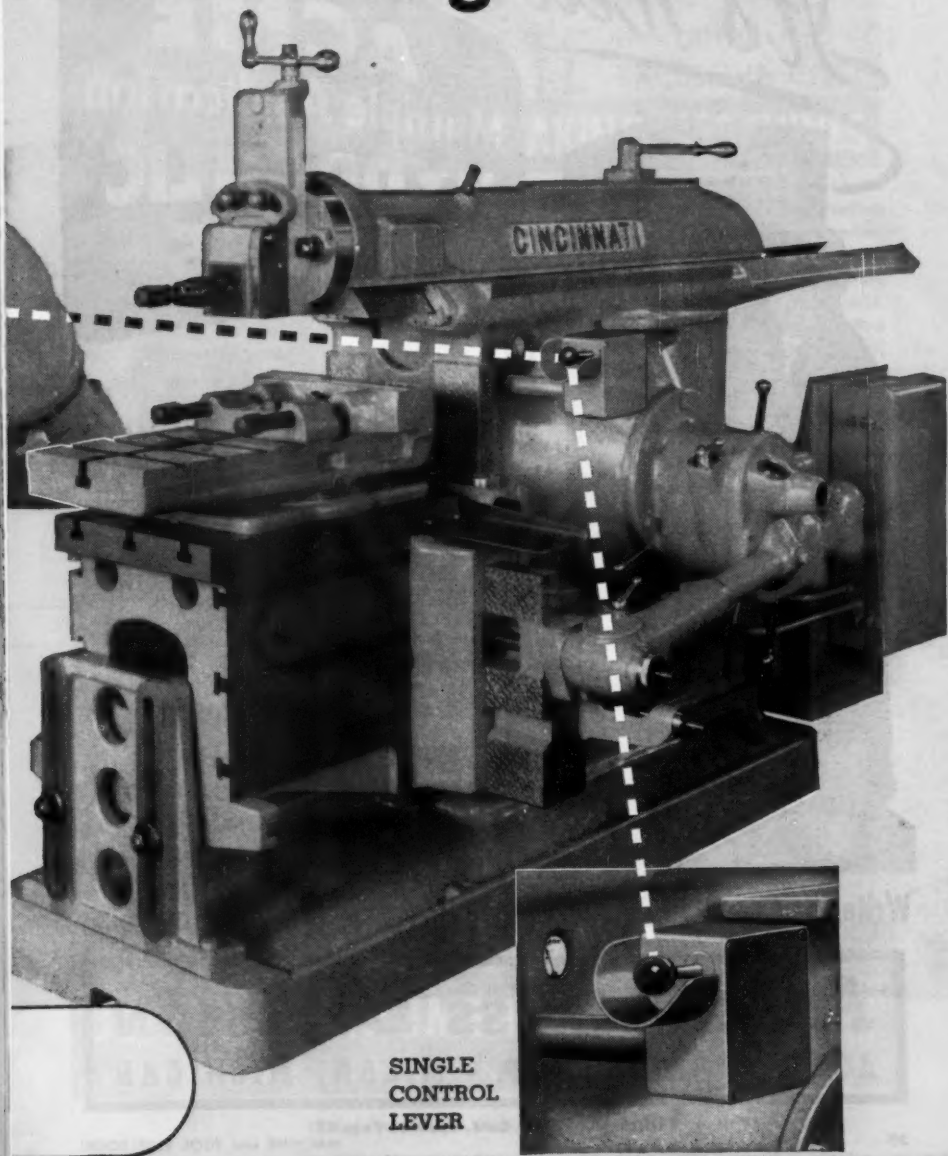


THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A.

SHAPERS • SHEARS • BRAKES

..Outstanding ACCURACY



It's New!

ACME Multiple Application HYDRAULIC PRESS



It's Simple!

a youngster can operate it!

Here's a machine, which, owing to the fact that it can be used for so many purposes, will prove valuable and profitable in your plant. Just another instance where Acme is constantly alert in meeting present-day production requirements.

Versatile!

use it for:

STAKING	BROACHING
FORCING	ASSEMBLING
CRIMPING	PUNCHING
TRIMMING	FORMING
BENDING	MOLDING
BALLIZING	STRAIGHTENING

Write for Complete Details

ACME PRESS DIVISION
ACME BROACH CORP. • MILAN, MICHIGAN

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MACHINE and TOOL BLUE BOOK

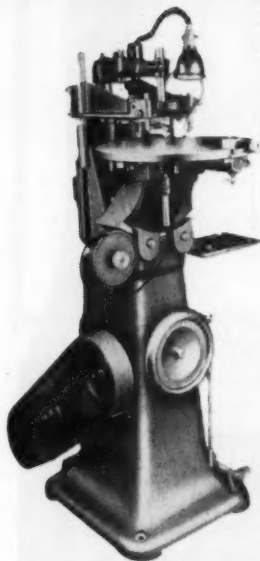


"CAST OFF" Waste and Inefficiency

ELIMINATE INACCURACY
EXCESSIVE COSTS

*Equip
with*

OLIVER DIE MAKING MACHINES



Loss of profits, directly caused by the waste and inefficiency of outmoded die making methods, will be virtually eliminated when you equip your toolroom with **OLIVER DIE MAKING MACHINES**. Proved daily in more than 10,000 installations around the world, the efficient Olivers consistently effect cost reductions as much as 60% through simplifying sawing, filing and lapping operations.

The economical **OLIVER DIE MAKERS**, engineered, designed and built by Oliver of Adrian, save you time . . . are easy to operate . . .

do not require skilled labor. These labor and time saving factors are important reasons why so many plants have been using Olivers for more than 30 years.

Unsurpassed for accuracy on Dies, Production Filing, Experimental Work, Metal Patterns, Cams, Gages and Templates, the precision-made **OLIVER DIE MAKING MACHINES** have been proved indispensable in maintaining production schedules . . . increasing output . . . and reducing high die making costs.

Be sure to see the Oliver Line—Booth 604 at The Machine Tool Show.

Oliver Die Makers available in 5 models—

The Bench Model S-1 (illustrated) is a single speed die maker for use on tool steel up to 1" thick.

The Heavy Duty Model (illustrated) has 6 speeds, works in metal up to 3" thick, has variable strokes to 5" with hydraulic feed.

Write Today For Complete Technical Data on
OLIVER DIE MAKERS

See our catalog in Sweet's Directory

OLIVER INSTRUMENT CO.

1408 E. MAUMEE

• ADRIAN, MICHIGAN

**THE
MACHINE TOOL
SHOW**

CHICAGO, ILL.

SEPT. 6-17, 1955

INTERNATIONAL AMPHITHEATRE

**MACHINE TOOLS
by OLIVER include:**

AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS
DRILL POINT THINNERS
TEMPLATE TOOL GRINDERS
FACE MILL GRINDERS
DIE MAKING MACHINES

Stampmaster

New, Improved Noblewest HAND NUMBERING DEVICE

FOR PERMANENT SUNK IMPRESSIONS

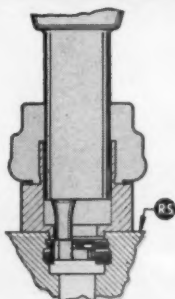
This new, improved hand numbering device is ideal for random or selective numbering on all types of metal products where a permanent sunk impression is to be applied. Part numbers, key code numbers and similar identifying data can be set up quickly and easily by indexing individual wheels. Small and compact, it is ideal for carrying to the work when not practical to take the work to the tool. Stampmaster is currently available in 1/16", 3/32" and 1/8" figure sizes. Heads are available in various wheel capacities. Popular sizes are stocked for immediate delivery. Special character combinations also available. For literature and prices write the Noble & Westbrook Mfg. Co., 9 Westbrook Street, East Hartford 8, Connecticut.



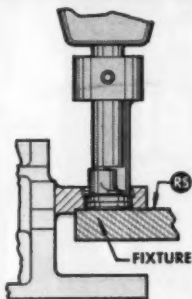
NOBLEWEST
IMPROVED
MARKING
DEVICES

MARK IT BEST WITH
NOBLEWEST
ORIGINATORS OF THE ROLL MARKING PROCESS

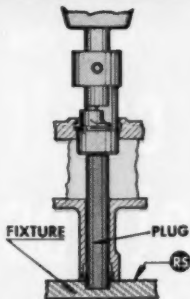
Even Unskilled Labor Can Use This Versatile Tool Accurately! It Simplifies Internal Grooving Problems, Cuts Production Costs!



A) Cuts two grooves of different depths and widths in one single operation from same reference surface.



B) Cuts groove in bore located in protruding member of workpiece. Reference surface on under side of protrusion.



C) Cuts grooves in two bores of different diameters from same reference surface. Tool banks on reference surface. Then workpiece is reversed and tool banks on plug.

Amazingly versatile! Your toughest recess cutting problems can be met simply and efficiently with the Waldes Truarc Grooving Tool because it offers a whole range of possibilities beyond the range of ordinary recessing tools.

Wide Cutting Range! The Waldes Truarc Grooving Tool comes in 5 models...enabling you to cut accurate grooves in housings with diameters from .250 to 5.00 inches.

Send Your Problems to Waldes! Send us your blueprints...let Waldes Truarc Engineers give you a complete analysis, price quotation and delivery information on the most economical tool set-up for your particular job. There is no obligation!

Write NOW for a 20-page manual containing full information on Waldes Truarc Grooving Tool



WALDES
TRUARC®
GROOVING TOOL

Made by the Manufacturers of Waldes Truarc Retaining Rings
WALDES KOHINOOR, INC., 47-16 Austel Place, L. I. C. 1, N. Y.
Waldes Truarc Grooving Tool Manufactured
Under U. S. Pat. 2,411,426



Waldes Kohinoor, Inc., 47-16 Austel Pl., L. I. C. 1, N. Y.
Please send me your new 20-page technical manual
on the Waldes Truarc Grooving Tool. WT077

Name _____

Title _____

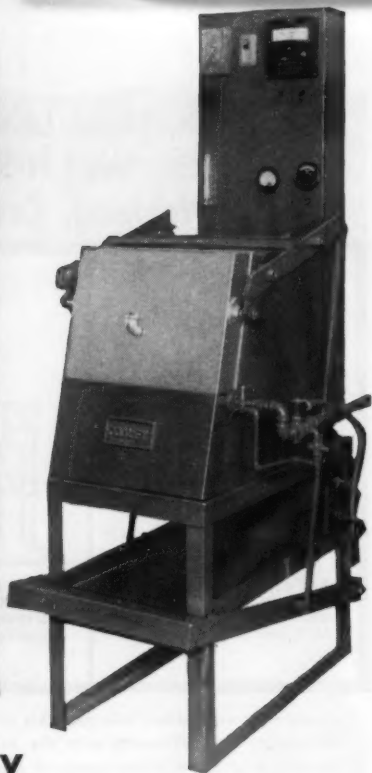
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Address _____

City _____ Zone _____ State _____

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the new
Cooley
 BATCH TYPE
 controlled
 atmosphere
 heat treating
 furnace



—designed especially
 for tool rooms and small production

This new Cooley GA-3 electric is the first small furnace to provide atmosphere protection with a reasonable investment and low operating costs. The atmosphere is generated by cracking alcohol and water of proportions predetermined to suit the application. Steel may be clean hardened without decarburization, or may be carburized.

As a package unit, the Cooley GA-3

includes a fully wired temperature control panel and atmosphere generating unit. A sealed alloy retort with tightly closed door, automatic gas curtain and foot operated door mechanism are other features that help assure dependable, economical operation—with little adjustment required. Write or wire for catalog—investigate the possibility of this new furnace for your work.

COOLEY ELECTRIC MANUFACTURING CORPORATION

36 SHELBY STREET • INDIANAPOLIS 7, INDIANA

Cooley

**HEAT
 TREATING
 FURNACES**

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**INCREASES
PRODUCTION...**

LOWERS COSTS...

**PAYS FOR ITSELF
QUICKLY...**

The ROUSE HAND MILLER is a widely used, inexpensive, high speed, ball bearing, motor driven machine for handling light cuts in brass, aluminum, steel, plastics, and other materials—fast, accurately, and at very low cost. Only \$110.00*

Fixtures (illustrated) extra.

Motor equipment:— $\frac{1}{4}$ H.P. 110 Volt AC 60 cycle, single phase, swivel motor mount and light—\$36.00*

*All prices FOB Chicago.



- ★ **MILLS SMALL PARTS MUCH FASTER.**
- ★ **DRASTICALLY CUTS YOUR INVESTMENT IN EQUIPMENT.** Replaces expensive production machinery—or releases it for other jobs.
- ★ **INEXPERIENCED HELP CAN OPERATE IT.** Safe, simple, fool-proof operation.
- ★ **NO MORE COSTLY SET-UP TIME.** \$110.00* price so low that it pays to keep one or more Hand Millers always set-up for special operations.
- ★ **YOU GET A BETTER PRODUCT**—the result of ABSOLUTE ACCURACY.
- ★ **A LOSS BECOMES A PROFIT** when marginal pieces are finished on the Hand Miller instead of on high cost equipment.
- ★ **VERY LOW MAINTENANCE.**
- ★ **USED REGULARLY IN 1163 MANUFACTURING PLANTS** (some of which use as many as 30 machines)—yet on the market a scant few years.
- ★ **UNIQUE—VERSATILE.** Nothing else like it. One or several machines can be the answer to some of your production problems.

**Write today
for further
information.**

H. B. ROUSE & COMPANY

2214 N. WAYNE AVE., CHICAGO 14
50 YEARS OF SERVICE TO INDUSTRY

Your wiping problems increase in hot weather..



ABSORPTION
is amazing...
"Perf-Embossed"®
texture gives Scott
Wipers their dirt-
gripping, oil-drink-
ing power



another reason for switching to Scott Wipers

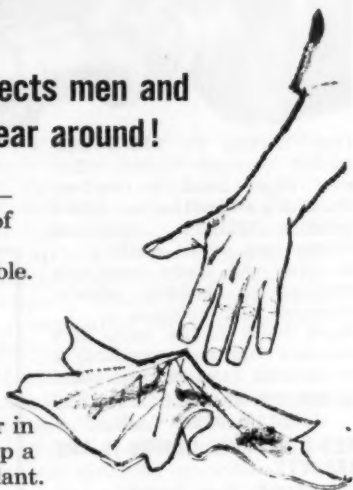
This remarkable new product protects men and metal... steps up efficiency all year around!

Because a fresh one is always available—Scott Wipers provide a constant source of clean wiping material.

Scott Wipers are sanitary and disposable. They end the laundering problem... simplify distribution and control.

Compare them with whatever wiping material you're using now—for cost, convenience, performance.

The Scott representative or distributor in your area stands ready to help you set up a production line demonstration in your plant. Call him or mail this coupon today.



**And, best of all,
Scott Wipers are
DISPOSABLE!**

DISTRIBUTION is simple...

The Dispenser-box
is a portable supply
of 125 wipers



SCOTT PAPER COMPANY
Dept. MT-B, Chester, Pa.

Please send me full information on
Scott Industrial Wipers.

Name _____

Company _____

Address _____

City _____ State _____

Certainly! MICRO FINISH IS POSSIBLE — Consistently!

RED-E CENTER users get it . . .
have for the past 10 years!

They depend on RED-E anti-friction grinding centers wherever super finish is required. They standardize on RED-E grinding CENTERS . . . eliminate chatter and wheel marks . . . do away with costly down time required in changing wheels, diamonds, and coolants.

Super finish to the micro inch becomes easy and economical at accelerated rates of production!

ACCURACY IS HELD TO LESS THAN .00005 T.I.R.

RED-E BEARING DESIGN IS THE SECRET!

Only RED-E. New Departure (exclusive) ABEC 7 specification, angular contact, preloaded, locked-in bearings have the ability to support the greatest radial and thrust load capacities. Mounted DB for positive preloading and GUARANTEED ACCURACY.

TWO TYPES FOR YOUR NEEDS



Shank Type



Spindle Type

SOLID CENTERS:

Your RED-E Industrial Distributor is stocked with a full line of CARBIDE TIPPED and HIGH SPEED CENTERS in Morse, B&S, Jarno, Norton and Landis Tapers—halfs and fulls.

CENTER Specialists Since 1908

READY TOOL COMPANY

550B Iranistan Ave. • Bridgeport 5, Conn.

Your One Source For All Centers

Encircle No. 229 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

. . . and this is why!

1. **RED-E PRECISION BEARINGS** are designed especially for grinding applications.
2. **POINTS** are high speed steel, designed to make rigid, positive contact with workpiece.
3. **WORKPIECE and CENTER** are integral, with constant positive pressure against wheel.
4. **BEARING ASSEMBLY** is locked-in, to assure perfect cycle of load distribution.
5. **OVERHANG** is short, workpiece is held rigidly.
6. **LUBRICANT** sealed-in-for-life with special bearing filtered grease.
7. **LABYRINTH** enclosure seal designed to protect bearing assembly from entry of coolants.

TAPERS AVAILABLE

		SHANK TYPE		Landis (Large Dia.) .8125, 1.335, 1.750
Morse	B&S	Jarno	Norton	
1 to 6	5 to 15	4 to 20	10 to 16	
		SPINDLE TYPE		.8125, 1.335, 1.750
2 to 7	7 to 18	6 to 20	10 to 24	

Special heads, tapers, shanks and points made to order. Investigate RED-E grinding center accuracy without delay!

What Were YOUR Cut-Off Costs Last Year?

- ☐ Extortionate
- ☐ Frightening
- ☐ Exorbitant
- ☐ Average
- ☐ Comfortable
- ☐ Pleasantly Low

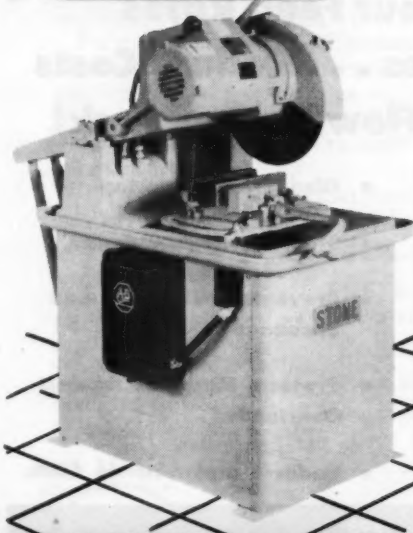
Modern M75 by Stone Built to Reduce Costs ...because it's built to LAST!

Long, trouble-free service under the toughest conditions is assured by rigid construction of the M75. Modern engineering enables you to cut *faster* . . . average 2 to 4 seconds per sq. inch in ferrous, non-ferrous and non-metallic materials. Cut *cheaper* . . . increase your production by margins that add up to increased profits overall!

Machinery by Stone . . . a complete line . . . includes standard and exclusive features that will enable you to realize *all* the profit-potential on your particular operations.

Ask about the geared-in-head motor—an exclusive Stone feature—which delivers maximum power direct to the cutting edge for top efficiency. Our representative will gladly discuss your requirements with you. No obligation: simply write or phone.

"Cut-off machinery by Stone . . . represented in every major industry throughout the world."



STONE MACHINERY COMPANY, INC.

11 FAYETTE ST.
MANLIUS, N. Y.

Encircle No. 230 on Card, Opposite Page 65



Now—Lock Your Feed Rates to Protect Machines . . . Reduce Costs with the **CROSS** Flow Control Lock!

Only authorized personnel carry a key for the Cross Flow Control Lock! They set machine feed rate, then lock it.

Easy to install. Just remove valve nameplate and adjusting lever, re-install over lock mounting plate.

Available for Vickers 1/4" flow control valves and remote control panels.

For full details, write Dept. A-57

- Eliminates Tampering
- Stops Costly Shutdowns
- Prevents Tool Abuse and Breakage
- Protects Machines Against Overloads
- Reduces Maintenance Costs

Established 1898

THE **CROSS** CO.
DETROIT 7, MICHIGAN

THE **CORRECT** BLANCHARD WHEEL
GETS YOUR NOSE OFF THE GRINDSTONE

... WITH **BEST SURFACE
GRINDING RESULTS!**



BLANCHARD SURFACE GRINDERS give you peak production and economy when maintenance is performed on schedule, and when you use the best wheel for each job.

For more than 25 years, Blanchard has been making wheels that do their jobs in less time, with less trouble and cost . . . whether the work is tough as copper or fragile as glass . . . whether it requires heavy roughing cuts or clean-up cuts with flatness of .000005" to .000010" and finish of 1 to 3 micro-inches.

Our quarter century of experience has proven that Blanchard grinders perform best with Blanchard wheels...on every job!

SEND

FOR OUR NEW,
FREE FOLDER
on Blanchard cylinder,
sectored and
segment wheels —
in silicate, resinoid
and vitrified bonds.

PUT IT ON THE



THE BLANCHARD MACHINE CO.

64 STATE STREET • CAMBRIDGE 39, MASS., U. S. A.

Gentlemen:

- ☐ Please send new *Blanchard Wheel and Segment folder*.
☐ Please send *The Art of Blanchard Surface Grinding*.

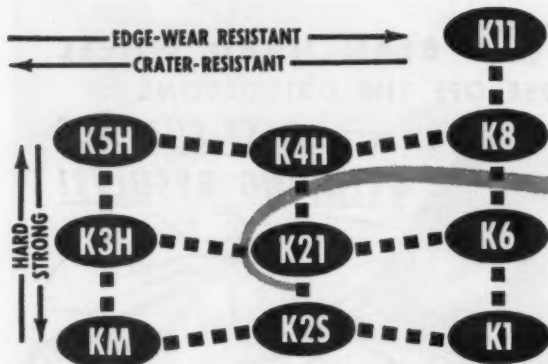
NAME _____

TITLE _____

FIRM _____

STREET _____

CITY _____ ZONE _____ STATE _____



Use Grade K21—the NEW Kennametal® General Purpose Steel-Cutting Grade

The Grade Selection Guide (above), which groups Kennametal grades according to strength, hardness, and wear characteristics, pinpoints the new K21 as a medium grade for general purpose steel-cutting applications. It is stronger than K5H, K4H, and K8. It has greater edge-wear resistance than K3H and KM, and more crater resistance than K11, K8, K6, and K1. Thus, K21 is for moderate, as well as heavy roughing of scaly, abrasive steel castings and forgings, and for interrupted cutting and milling operations requiring high resistance to edge wear, to cratering, and to shock. K21 shows exceptional performance on modern high-speed machines, and, due to its range, does an excellent job on older, slower-speed machines as well.

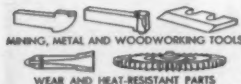
Because of this performance, K21 is rapidly becoming recognized as the leader of all general purpose steel-cutting grades. It's a premium grade at no extra

cost. Ask your Kennametal Representative for performance facts; and for a copy of the Grade Selection Guide shown above . . . it's the most simple system of selecting the right grade for every job that has ever been developed.

Kennametal Engineers are ready to help you

Every Kennametal Representative is a tool engineer. He is trained to help you analyze tool wear—apply the right tool and grade to the job—establish proper lathe speeds and feeds—train machinists to get increased production at the lowest possible cost with Kennametal Tools. In addition to his own broad experience, he has available to him the backgrounds of 150 other Kennametal Tool Engineers. His office is listed in the classified telephone directory in principal cities. Call him, or write KENNA-METAL INC., Latrobe, Pa.

* Registered Trademark

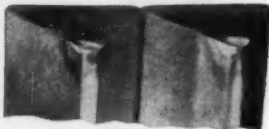


INDUSTRY AND
KENNA-METAL
... Partners in Progress



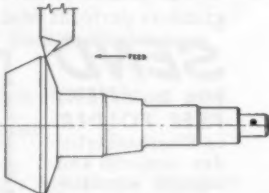
K21

Shows Exceptional Wear Resistance



Grade K21, on the left, shows less wear than competitive grade (at right) after turning 100 pieces.

Four competitive grades of cemented carbides were used in a recent comparative test machining SAE 4620 rear axle drive pinion forgings. (See drawing below.) Each grade was removed for examination of the cutting edge after turning 100 pieces. The competitive inserts showed sufficient wear to require indexing to a new cutting edge, while the Grade K21 insert (at left above) turned 200 additional pieces before it was indexed. This 3 to 1 ratio in tool life typifies the results being obtained on many types of machining jobs with this new Kennametal grade, including forgings, sandy castings, centrifugal castings, plate, weldments and highly abrasive silicon steels.



VISIT US AT THE
MACHINE TOOL SHOW
Chicago, starting Sept. 6, 1955
Booths 410-411, Navy Pier, and
Booth 123, Chicago Amphitheater

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MACHINE and TOOL BLUE BOOK

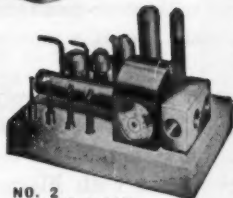


MILLING MACHINE VISE

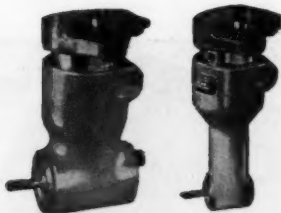
Improved and providing great gripping power, with large diameter screw for rigid holding. Streamlined for appearance and equipped with coolant trough. Two sizes: 5"x3½" and 6"x5" jaw openings.



CHERRYING ATTACHMENT
Makes possible production of convex and concave shapes. Ideal for producing drop forge dies, molds, cavities, metal core boxes, etc.



NO. 2 BORING HEAD
Boring Tools and Holder provide means for boring holes up to 6" diameter; available for use on Bridgeport 1 HP Milling, Drilling and Boring Attachment.



RIGHT ANGLE ATTACHMENTS

(Left) Heavy Duty . . . for milling and drilling at right angles; fits both Master and 1 HP Bridgeport Heads. (Right) Light Duty . . . for right angle milling and drilling narrow, deep molds and cavities.

The Basic Idea back of ***Bridgeport***

TURRET MILLING MACHINES

was conceived,
created, developed and made
universally practical
by **BRIDGEPORT Engineers.**

Universal acceptance of Bridgeport Millers has established beyond the shadow of a doubt that the basic principle in these machine tools is **RIGHT**. It also means that there was a definite need for a machine of this type to replace other machines which had outlived their usefulness. It means, too, that Bridgeport Turret Milling Machines can be installed in any shop for tool room or production line without radically upsetting procedures which have been in conventional use.

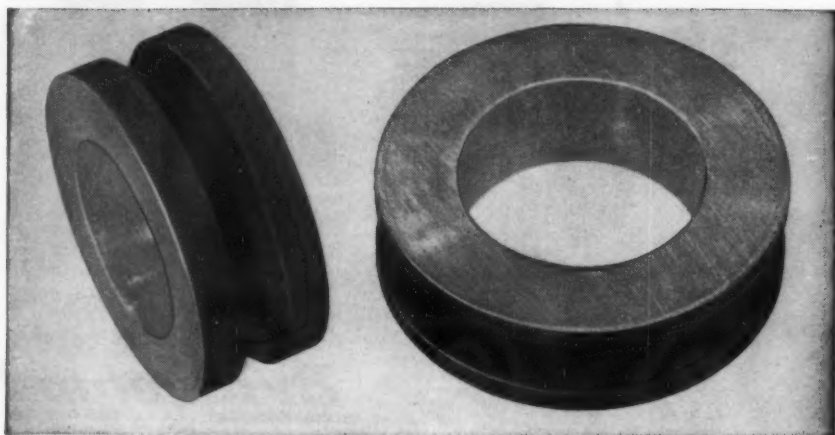
BRIDGEPORT MILLERS have met existing conditions universally. Careful production planning in Bridgeport's own new shop has made it possible to offer exclusive advantages at a maintained reasonable price, a fact which indicates that their designers and manufacturers have made an outstanding contribution to modern metal working progress.

Investigation of Bridgeport Milling Machines and their many attachments is always in order.

Bridgeport MACHINES, INC.

Bridgeport, Connecticut

Manufacturers of High Speed Milling Attachments and Turret Milling Machines



How Flame-Plating keeps **DOWN-TIME** Down

Deep grooves worn in straightening rollers by small diameter wires often badly score larger wires which are passed through the same set-up. The result—costly machine down-time periods are necessary to change rollers. One manufacturer solved this problem by using rollers Flame-Plated with wear-resistant tungsten carbide. Now, machine down-time costs are at a minimum and a better product is produced.

Flame-Plating is a new LINDE process for applying wear-resistant coatings of tungsten carbide to the wear surfaces of parts and many tools made of most common metals. For the full story on how you can solve your wear problems with Flame-Plating, send for new "Flame-Plating" booklet.

LINDE AIR PRODUCTS COMPANY

A DIVISION OF UNION CARBIDE AND CARBON CORPORATION

30 East 42nd Street, New York 17, N. Y. **UCC** Offices in Other Principal Cities

In Canada: LINDE AIR PRODUCTS COMPANY

Division of Union Carbide Canada Limited, Toronto

The term "Linde" is a registered trade-mark of Union Carbide and Carbon Corporation.



Encircle No. 235 on Card, Opposite Page 65

CONVERT

YOUR OUTMODED
PLANERS INTO POWERFUL, MODERN
PLANER-TYPE MILLING MACHINES

With

PORTLAND'S
HEAVY DUTY
MILLING HEAD

The Portland Heavy Duty Milling Head can be used to convert your planer to a modern high-production planer type milling machine.

Standard heads are provided with 22 speeds in geometrical progression from 20 to 1000 r.p.m.

High speed Heads available up to 10,000 r.p.m.

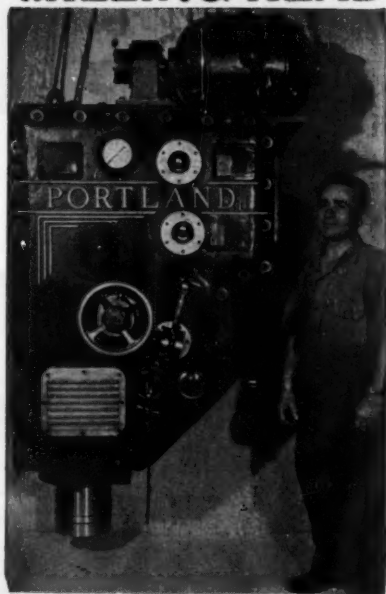
Infinitely variable hydraulic feed from 0" to 60" per minute enables a fine adjustment of cutting rate for maximum efficiency.

Heads are available 10 to 100 HP.

Quill sizes—7½" to 20".

For that difficult problem in metal machining, avail yourself of PORTLAND engineering.

*For further details
send for brochure BB.*



PORTLAND

MACHINE TOOL WORKS, INC.

NOW! . . . fastest automatic in its range!

. . . as much as . . .

40%

HIGHER



Encircle No. 237 on Card, Opposite Page 65

higher speed

Speed Range from 7200 to 34 rpm.
208 Spindle Speed Combinations
for stock up to 1/2" diam.

higher capacity

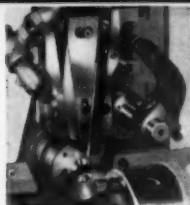
Turning Length to 1"; up to 1 1/2"
with extra equipment.

higher rigidity

Cross Slides and Detachable Ways
of hardened, ground steel.

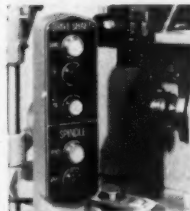
The most advanced automatic on the market for stock up to 1/2"! Push-button controlled. Actually increases output as much as 40% on many jobs — steps up others correspondingly. It's the new Brown & Sharpe No. 00 Automatic Screw Machine. Exclusive design features provide faster, easier set-ups . . .

OUTPUT



Improved Vertical Tool Slide, for extra tool position, is standard equipment.

Driveshaft driven by 2 pick-off gears — no belts. Safety device prevents rotation in wrong direction.



Push-button control — one of several features that cut set-up time materially.

. . . exceptional speed and turning capacity . . . outstanding accuracy . . . permit carbide tooling where desirable. The most versatile, productive automatic in its range . . . assures highest cutting efficiency on all precision work. Write for full details.

Brown & Sharpe Manufacturing Co.,
Providence 1, Rhode Island.



Brown & Sharpe

Keep your eye on Buckeye

*and this ALL-NEW
power-packed grinder
—weighs just 4½ lbs.!*

You'll look a long while before you'll find a grinding job that can't be handled by one of these NEW Buckeye horizontal grinders! Plenty of power to handle a 6" wheel on heavy work . . . can be used with roll-type abrasives or wire brush, and will do a top-notch job with either . . . can even be used with a tool post holder for accurate work.

You'll like the built-in muffler that cuts down exhaust noise, yet has no external parts to add to tool diameter. You can adjust the exhaust deflector to any position in a full 360° circle. Steel case encloses tool at largest diameter, provides added protection, insures longer wear.

Maintenance on this tool is amazingly simple. Tool can be disassembled without any special tools, and all working parts are readily accessible for checking and servicing when necessary. Available in four speeds, 15,000 to 6,000 RPM. Capacities to 4" vitreous wheel, 6" organic wheel.


Catalog G-10 has the full story on these all-new Buckeye grinders, plus complete information on the most complete line of portable, air-powered abrasive tools available anywhere. Write—today—for your copy.



Buckeye Tools
CORPORATION
DIVISION 14 • DAYTON 1, OHIO

IN CANADA: Joy Manufacturing Co., Ltd., Galt, Ontario


producers of
the world's first
successful
rotary air tools




Proven

Supreme Brand Chucks were engineered to outperform everything in the market. Proof of their success can now be drawn from the fact that 34 of the leading power tool makers are now equipping all or an important part of their output with Supreme Chucks.

Best on new equipment . . . best for all replacement use.



the chuck that lives up to its name ... Supreme



Supreme BRAND Chucks

SUPREME PRODUCTS, INC., 2222 So. Calumet Ave., Chicago 16, Ill.

Encircle No. 239 on Card, Opposite Page 65

July, 1955

49

Only **ACTIVE** sulphur

provides Fluid Lubrication

• • • •

This comparative test proves it! Both tests were run on an SAE Lubricant Tester using two oils with the same percentage of sulphur. The specifications were similar—but look at the results!

The set of rings on the left were run with an oil containing "lazy" sulphur that did not provide the necessary anti-weld qualities. Under the heavy loads present in the test, the rings quickly galled and seized. The pair on the right were run with an oil containing "active" sulphur, the *only* type of sulphur that will prevent galling or seizure. It is performance that counts, not specifications!

"Active" sulphur in a cutting oil, readily reacts with the metal surfaces of the tool, chip and work-piece to produce metallic sulphide films that become

fluid lubricants when sufficient heat is generated, and provide lubrication under the high temperatures that exist in the cutting orbit.

Stuart Oil Company's Shop Note Book, S-2 contains further information on how to select a sulphurized cutting oil. Write for your copy today, and ask to have "the Man in the Barrel", your Stuart Representative, call too. He will help you select the cutting fluid that will provide the very best results under the conditions you will subject it to.

D. A. STUART OIL COMPANY, LTD.
2749 S. Troy St., Chicago 23, Ill.

More than a "Coolant" is Needed

Plants in: Chicago, Detroit, Cleveland, Hartford, and Toronto, Ontario.

Branch Warehouses and Representatives in principal metal working centers in the United States, Canada and Europe.

. . . under EXTREME PRESSURES . . .



Test rings run with oil containing 1.5% "lazy" sulphur. Note galled surfaces.

Test rings run with oil containing 1.5% "active" sulphur. Note polished surface finish.



Stuart Oils

Time Tested Cutting Fluids and Lubricants

July, 1955

Encircle No. 240 on Card, Opposite Page 65

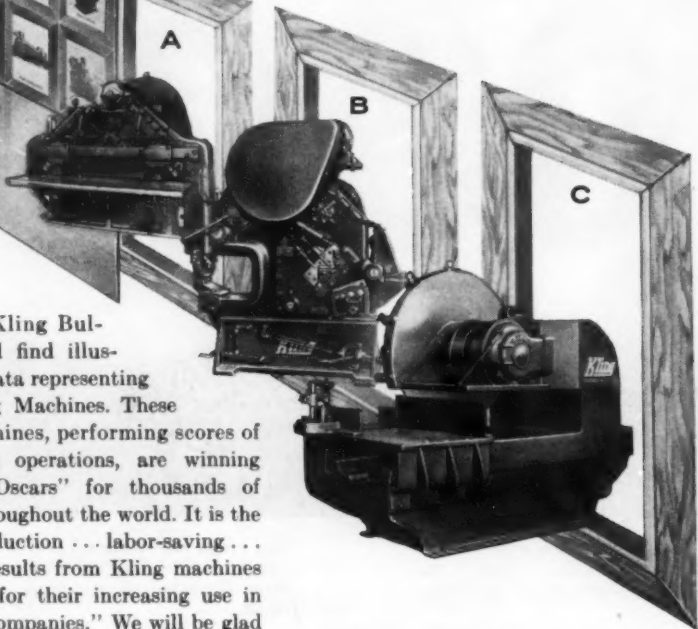
51



Now See the Entire Collection of
"Award-Winning"
Kling Metal Fabricating
Machines in this
New Bulletin 100



In the new Kling Bulletin you will find illustrations and data representing over 50 Kling Machines. These versatile machines, performing scores of metal-working operations, are winning "Production Oscars" for thousands of companies throughout the world. It is the increased production . . . labor-saving . . . cost-cutting results from Kling machines that account for their increasing use in "the best of companies." We will be glad to send you a list of users in your industry, along with your free copy of the new Complete Line Bulletin 100. Why not send for it today?



- A** KLING DOUBLE ANGLE SHEARS
B COMBINATION SHEAR, PUNCH & COPERS
C HIGH SPEED FRICTION SAWS

Since 1892

Kling

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Makers of Friction Saws; Shears—Rotary, Double Angle and Guillotine; Punches; Combination Shear, Punch and Copers; Angle and Plate Bending Rolls; Bulldozers.

Export Distributor: Simmons Machine Tool Corp.
 50 E. 42nd Street, New York 17, N. Y.

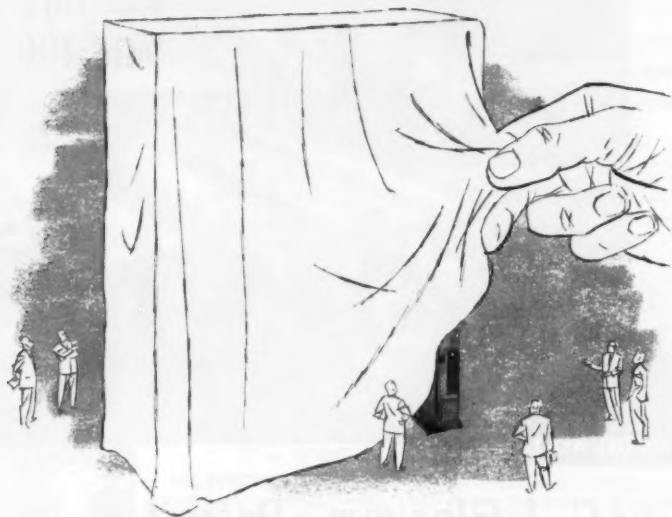
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September 6 to 17



and the Unveiling of the Largest Double-Action Mechanical Press in the World

● While in Chicago, during the Machine Tool Show, be sure to visit the Version plant. Version presses will be in operation for your examination in our new Research, Development and Exhibit Center.

Unveiling and presentation of the new Version double-action mechanical press, the largest in the world,

will take place during the Open House. It's the one event that you don't want to miss while in Chicago.

Write today. Plan your trip to the Version Open House now. We will be pleased to arrange transportation for you between the Show, or your hotel, and the Version plant.



ORIGINATORS AND PIONEERS OF ALLSTEEL STAMPING PRESS CONSTRUCTION
VERSION ALLSTEEL PRESS CO.

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MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES
TOOLING • DIE CUSHIONS • VERSION-WHEELON HYDRAULIC PRESSES

Encircle No. 242 on Card, Opposite Page 65

PUTTING THE PRESSURE ON PRE-FAB BUILDING PANELS



at C. J. Glasgow—Detroit

When Lapeer air clamps replaced hand-operated clamps at C. J. Glasgow Co., Detroit, production of prefabricated building panels jumped 75%! In addition, rejects nose dived and quality control soared to a new high.

Sheets of galvanized steel are bonded to hot rolled formed steel channels (see illustration). Lapeer air clamps provide 100 p.s.i. around the jig.

This is just one more example of Lapeer clamps as used in industry. Automotive applications—in farm equipment—in metal working plants—all prove that Lapeer can put the pressure on!

Write
for
catalog
today!



Manufacturers of a complete line of Stationary and Portable Clamps and Pliers

**KNU-VISE
PRODUCTS**

LAPPEER MANUFACTURING CO.

3052 DAVISON ROAD

WESTERN DIVISION, 422 Magnolia, Glendale, California



LAPPEER, MICHIGAN

CANADIAN DIVISION, Higginson Engr., Hamilton, Ontario



MASTER MACHINE TOOL ATTACHMENTS

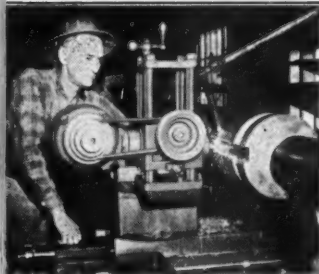


1. 90° Universal Milling Head
2. Hi-Speed Milling and Drilling Head
3. Deep-Hole Internal Grinder Head
4. Basic Milling Unit
5. Milling and Grinding Table
6. Universal Feed Table
7. Internal Grinder Head
8. External Grinder Head
9. Slotting and Keyseating Head
10. Geared Dividing Head

Increase Production on LATHES, TURRETS, MILLS

Build Special Production Machines with Master Heads and Independent Feeding Mechanisms! Save Time and Money by Relieving Your Independent Machines!

The Master attachment can be used profitably on many production operations. Mount it on your present equipment, lathes, turrets, mills, or use independently to perform additional operations in the same set-up. The basic milling unit with the above types of precision heads gives you facilities for milling, grinding, thread milling, boring, drilling, indexing, slotting, and keyseating, internal and external. Performs all operations for maintenance, tool room, and production at a minimum investment.



End Milling 2 1/2" Keyway in 9/8" Diameter shaft 22-ft. Long

MASTER LATHE CONVERTER is available in four sizes:

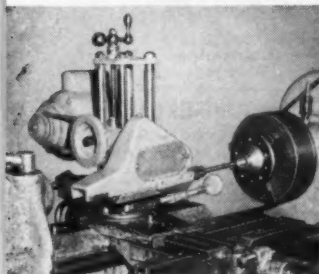
- Model "C" 1/2 H. P. — 9" to 13" Lathes
Model "B" 1/2 or 3/4 H. P. — 13" to 18" Lathes

- Model "M" 1 to 3 H. P. — 18" to 72" Lathes
Model "H" 5 H. P. — 24" and Larger Lathes

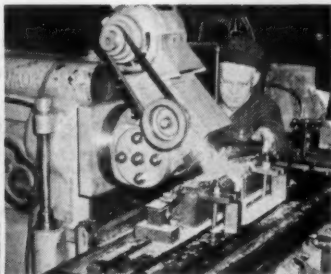
THE REVOLUTIONARY NEW TURRET-MASTER is a small, compact, powered tool head for turret lathes, which powers the tool for either *on* or *off* centre milling, drilling or boring, can be assembled for horizontal or vertical spindles 1/2 to 3 H. P.

THE GEARED VERTICAL MILL HEAD amplifies operations of horizontal milling machines by combining independent power and double compounded swivel for angular positioning with capacities from 3/4 H. P. to 5 H. P.

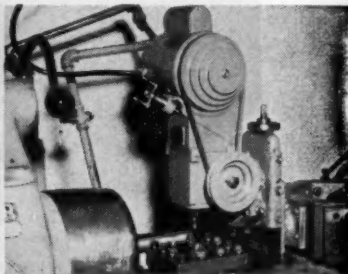
For the cost of one single-purpose machine, you can have several Master units producing. **Prompt deliveries!**



Master Slotting Head on Lathe Cutting Internal Taper Keyway



Geared Vertical Mill Head on a Horizontal Mill



Turret-Master End Milling Keyway on a Turret Lathe

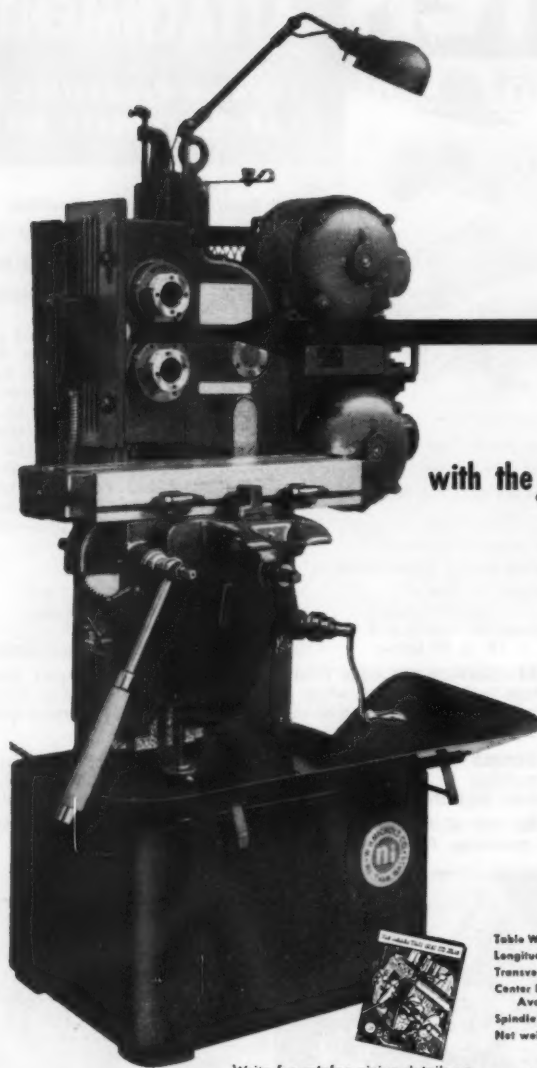


FREE

Ask your nearest Master dealer to show you the new 80-page Pictorial Operational Book. Write direct for free 24-page Catalog.

MASTER MANUFACTURING CO.

1302 EAST AVENUE A • HUTCHINSON, KANSAS, U.S.A.



TWO FOR ONE

with the *Nichols* Double-Decker!

The Nichols "Double-Decker" Two-spindle Miller actually gives you two milling operations in one pass! It is equally adaptable to small or large lot production of small parts where parallel flats or grooves, or otherwise must be indexed for two operations with a single cutter. Its time-saving features are readily apparent. Spindles may be separated from 4" to 7" (or more) to accommodate various sizes of cutters and work. Table can be arranged for hand operation or with automatic work cycle, and with high or low spindle speeds.

CONDENSED SPECIFICATIONS

Table Working Surface	6 $\frac{1}{2}$ " x 21"
Longitudinal Travel	10"
Transverse Travel	7"
Center Distance of Spindles Available Between	3 $\frac{1}{2}$ " and 14 $\frac{1}{2}$ "
Spindle Speeds Available	up to 3000 R.P.M.
Net weight approx.	1250 lbs.

Write for catalog giving details on lever, screw and air-feed models, plus three types of double spindle Nichols Millers.

Inquiries must be submitted in detail, as specifications and capacities are governed by user's needs.

MANUFACTURED BY W. H. NICHOLS COMPANY WALTHAM, MASSACHUSETTS

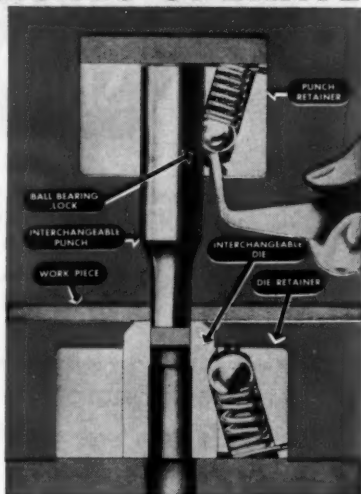
NATIONAL DISTRIBUTORS **NICHOLS-MORRIS CORPORATION**

78-G Mamaroneck Ave.
White Plains, N. Y.

Encircle No. 245 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

HOW R-B PUNCHES OPERATE



R-B standardized punches and die buttons are inserted in their retainers with a simple push and a twist.

Punches and die buttons are instantly removed by inserting a tapered tool in retainer hole to release the locking ball.

Each R-B retainer is equipped with a spring-loaded locking ball which engages the recessed portion of standard and special R-B punches and die buttons. Locked punches and die buttons are always accurately aligned—no additional keying is required.

Use R-B Engineering Service for Your Tough Piercing Problems.

RICHARD BROTHERS PUNCH DIVISION ALLIED PRODUCTS CORPORATION

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Please send me additional information.

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COMPANY _____

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Also Produced in OTHER ALLIED PLANTS

SPECIAL COLD FORGED PARTS

STANDARD CAP SCREWS

PRECISION GROUND PARTS

SHEET METAL DIES

MADE OF FERROUS ALLOYS,

ZINC ALLOYS OR PLASTICS



HAVE A PERFECT

**TAPERED
SHAPE**

New!

**-USE TAPER-CHAMP FOR
BORING AND TURNING
TAPER OR STRAIGHT
SURFACES . . .**

Rigid and accurate • Always dependable •

Tapers in EITHER DIRECTION, See photos.

Used on jig borers, boring mills, etc., for
blanking, piercing dies, drop forge dies,
patterns, etc. All parts hardened and
ground • interchangeable shanks



SHOWN
BORING
TAPERS

New!

Write Today!

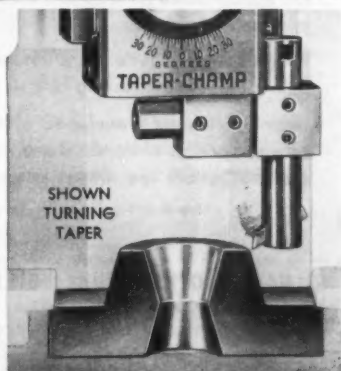
Write for complete information
on construction, performance and
operation. Chandler guarantees
workmanship, materials, accuracy and
performance • Made in America.

CHANDLER TOOL COMPANY

*Builders of the Chandler Duplex Combined
Boring and Facing Toolhead*

504 OHIO AVE.

MUNCIE, INDIANA, U. S. A.



SHOWN
TURNING
TAPER

Chandler TAPER-CHAMP

Encircle No. 247 on Card, Opposite Page 65

Norgren ... a complete line of PRESSURE REGULATORS

to Improve Performance, Reduce Wear of Air-Operated Equipment

MORE THAN 1,100,000 NORGREN REGULATORS PUT TO USE BY INDUSTRY

Reducing compressed air line pressures to proper working pressure for each piece of air-operated equipment is essential for high operating efficiency, long equipment life, and low maintenance costs.

More than 1,100,000 Norgren Regulators which have been put to use by industry prove the advantages of specifying Norgren for efficient, economical pressure regulation.

**Nearly 400 standard models to meet your needs
plus many others designed to meet specific performance requirements**



Air Regulators

Reduce line pressures as high as 400 psi to desired working pressure. Four spring ranges to choose from for best performance—50, 75, 125 or 250 psi maximum delivery. $\frac{1}{2}$ " through 1" pipe sizes. Series 2A.



Pilot-Controlled Air Regulators, Integral Type

Extreme precision over wide operating range. Reduce line pressures as high as 400 psi to desired working pressure from 2 psi to 120 psi. Three spring ranges to choose from for best performance—30 psi, 60 psi or 120 psi maximum delivery. $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1" pipe sizes. Series 20AC.



Cylinder Gas Pressure Regulators

Single-stage regulators to reduce cylinder gas pressures as high as 3000 psi to desired working pressure. Choice of four spring ranges for best performance—50, 75, 175 or 450 psi maximum delivery. Close, constant pressure control. 2 inlet ports, 3 outlet ports. $\frac{1}{4}$ " pipe size. Series 4C and 6C.



Relieving-Type Air Regulators

Reduce line pressures as high as 400 psi to desired working pressure. Four spring ranges to choose from for best performance—50, 75, 125 or 250 psi maximum delivery. The relieving feature protects connected equipment against abnormally high pressures. $\frac{1}{2}$ " through 1" pipe sizes. Series 2AX.



Pilot-Controlled Air Regulators, Remote Control Type

Extreme precision over wide operating range. Reduce line pressures as high as 400 psi to desired working pressure from 2 psi to 120 psi. Three spring ranges to choose from for best performance—30 psi, 60 psi or 120 psi maximum delivery. $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1" pipe sizes. Series 20AA.



Liquid Pressure Regulators

For lines carrying water, oil, non-corrosive liquids up to 200° F. Reduce line pressures as high as 400 psi to desired working pressure. Choice of four spring ranges for best performance—50, 75, 125 or 250 psi maximum delivery. 5 pipe sizes— $\frac{1}{8}$ " to 1" inclusive. Series 2M.



Precision Air Regulators, Relieving Type

Reduce line pressures as high as 400 psi to desired working pressure. Air flow up to 2 cfm with 30 psi maximum delivery. Also for flows of less than 1 cfm with maximum delivery pressures of 60 or 120 psi. $\frac{1}{4}$ " pipe size. Series 11, 400.



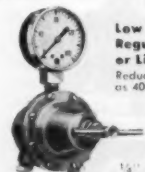
Low Pressure Air Regulators

Reduce line pressures as high as 250 psi to desired working pressure. Choice of 2 spring ranges for best performance—40 or 60 psi maximum delivery. $\frac{1}{4}$ " pipe size. Series 150S.



Steam Pressure Regulators

For lines carrying saturated steam and hot water with temperatures up to 450° F. Reduce line pressures as high as 400 psi to desired working pressure. Choice of four spring ranges for best performance—50, 75, 125 or 250 psi maximum delivery. $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1" pipe sizes. Series 2B.



Low Capacity Regulators for Air or Liquids

Reduce line pressures as high as 400 psi to desired working pressure. Choice of 2 spring ranges for best performance—50 or 175 psi maximum delivery. 2 inlet ports and 3 outlet ports. $\frac{1}{4}$ " pipe size. Series 3A2-B.



Butane Pressure Regulators

For primary stage pressure regulation on industrial and large domestic applications. Reduce line pressures as high as 250 psi to desired working pressure up to 50 psi. $\frac{1}{2}$ ", $\frac{3}{4}$ ", 1" pipe sizes. Series 2E.



Regulator-Filter Unit

Automatically filters air and regulates air pressure. Replaceable, transparent or metal bowl. Choice of 3 filter elements. With or without pressure gauge. $\frac{1}{4}$ " and $\frac{3}{8}$ " pipe sizes. Series 5A and 5M.

Phone the Norgren representative listed in telephone directory classified section under "Norgren Pneumatic Products," or write ...

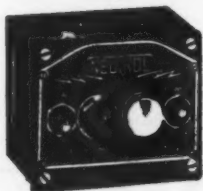
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WRITE FOR CATALOG

Includes latest developments and complete data on Norgren Pressure Regulators, Oil Fog Lubricators, Air Filters, Valves, Hose Assemblies.



Electrical CONTROLS FOR INDUSTRY



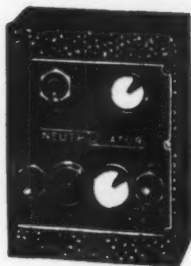
ELECTRO-MAGNETIC CHUCK CONTROL

Releases and demagnetizes work pieces simultaneously. No time lost. No damage to work or chuck face. Protects chuck from voltage surges. Speeds production. 50 to 15,000 Watts . . . 60 to 20,000 Sq. In. Chuck area.



ELECTRO-MATIC RECTIFIER

Engineered for dependable power conversion in constant year after year service. Quiet and efficient. For all industrial applications. 50 Watts to 40 Kilowatts.



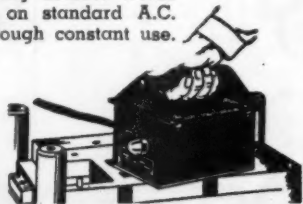
NEUTROL CHUCK CONTROL and HOLDING POWER REGULATOR

Combines the advantages of NEU-T-ROL with the benefits of absolute voltage regulation. Control of holding power is infinitely variable through entire dial range. Best holding power predetermined for an operation is automatically repeated. Assures true parallel grinding. Manual or motorized control models.

ELECTRO-MATIC A.C. DEMAGNETIZER

Demagnetizes dies, punches, cutters, tools that have been magnetized from any source. Works by simple contact. Operates on standard A.C. voltage. Will not overheat through constant use. A size for every purpose.

All Models Fully Warranted
Special Models Engineered to Meet Every Need
Your Inquiries Will Be Promptly Answered
Without Obligation

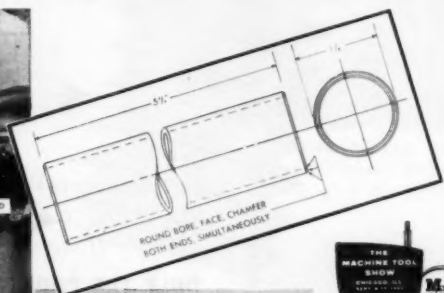
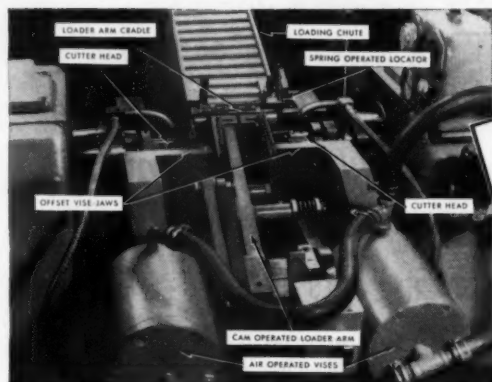


ELECTRO-MATIC PRODUCTS CO.
2235-37 N. KNOX AVE., CHICAGO 39, ILLINOIS, U. S. A.

Encircle No. 249 on Card, Opposite Page 65

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



MODEL "CS" Lo-swing SPEEDS MACHINING OF SHOCK ABSORBER TUBES

Problem: To automatically load, unload and machine both ends of Hydraulic Shock Absorber Tubes at high production rate.

Solution: The Model "CS" Lo-swing Automatic Drilling and Centering Machine selected for this job was equipped with an automatic loader of the type shown in the small illustration.

The tubes, which are cut 1/16" over the required length, are fed into the upper chute, shown in the large illustration, and ejected into the lower chute after being machined. Details of the loading arm, which is cam operated, are also shown in this illustration. Tubes are fed by gravity down the loading chute into the loading arm cradle where they are properly positioned lengthwise by a spring operated locator. The loading arm then lowers the tube into the air-

operated vise jaws where it is securely clamped, after which the loading arm is raised to pick up the next piece.

When the loading phase of the cycle is completed, the two revolving cutter heads advance in rapid traverse and slow down into feed just before the tools reach the work. Three cutters are used in each head... one cutter for facing to overall length, one for rounding the bore, and one for chamfering the O. D. The machining completed, the cutter heads retract in rapid traverse and the vise jaws open, allowing the finished part to drop into the unloading chute. The complete cycle is slightly under five seconds per piece, assuring a production of 750 pieces per hour.

Engineered jobs are our specialty. Seneca Falls is at your disposal to assist in solving your problem.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH Lo-swing

FOR HOB THREADING:

- NON FERROUS METALS

... YOU NEED **HIGH SPEED!**

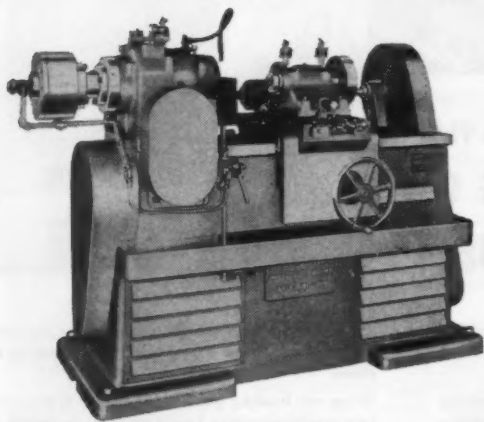
- HEAT TREATED MATERIALS

... YOU NEED **LOW SPEED!**

- VERY SHORT RUNS

... YOU NEED **QUICK CHANGEOVERS!**

ONLY THE COULTER "H1" GIVES **ALL THREE!**



EXTRA For Brass, Aluminum and Steel.

The "H1" makes provision for a separate motor to give the cutter and work spindle a larger range of speeds and feeds for threading these materials.

Machine Tool BUILDERS Since 1896

Yes sir, the COULTER "H1" Hob Thread Milling Machine is the only completely automatic machine that has such outstanding exclusive features for producing precision internal and external right-hand and left-hand threads — **ON A PRODUCTION BASIS!**

In addition, it's (a) fully **AUTOMATIC**, (b) works equally well with universal or air operated chucks, or special fixtures, (c) has work spindle with an extra large hole, (d) work can be inserted from face to rear end, (e) has pick-off gears and adjustable sheave drive.

It's the machine for you!

Send for complete information on the "H1" and other Coulter Automatic Threading Machines — no obligation.

The James Coulter Machine Co.
637 Railroad Ave. Bridgeport 5, Conn.

Encircle No. 251 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

Tough grinding jobs?

Check **Vulcanaire**
high speed precision
grinding heads!

Many seemingly impossible grinding problems have been solved by adapting Vulcanaire to standard machines or by using one of Vulcan's specially designed machines.

On Surface Grinders, merely remove wheel and guard, clamp vertical or horizontal adaptor to machine as illustrated. No belts necessary. For instance, Vulcanaire used in connection with Vulcan's Rotary Table and Magnetic chuck.

Adaptors are in stock to fit the spindle of Vertical Milling Machines for grinding contours, holes and slots.

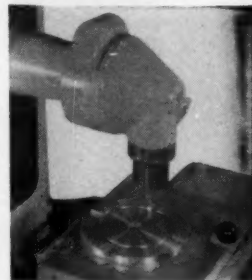
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Applied to Jig Boring Machines, Vulcanaire is liked by leading precision manufacturers because its accuracy is guaranteed, producing Vulcanaire jig grinding of large and small parts.

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Grinding circular slot using Vulcan's Rotary Table and Magnetic chuck.



Vertical adaptor for Surface Grinders. Grinding small slots



Horizontal application Grinding a Shoulder Punch.

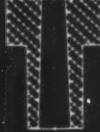
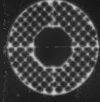
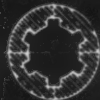
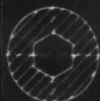
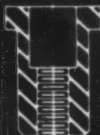
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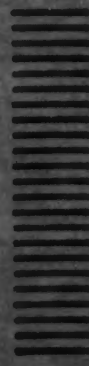
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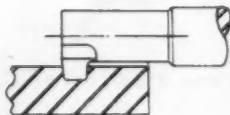
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Bokum grooving tools produce the precise groove needed for O-rings—meet the exact specifications of ring manufacturers. 15 different tools are available from stock for single O-rings, or for O-rings requiring one or two back ups. Larger diameters feature 2-piece construction.

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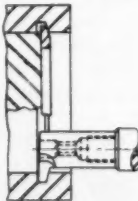
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BOKUM TOOL CO.

RETAINING RING GROOVING TOOLS

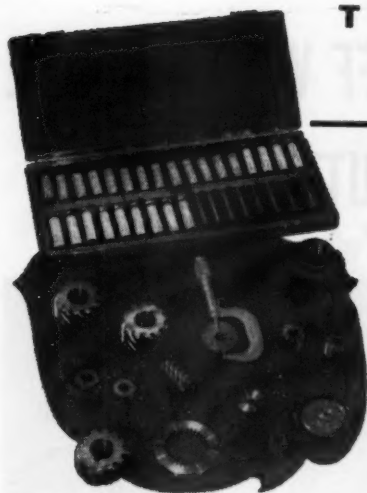
A range of 29 tools is available to cut exact grooves for standard or inverted retaining rings, bowed, beveled and self-locking retaining rings. 2-piece construction on larger diameters permits use of any length bar to compensate for the distance of the groove from the end of the work piece. Write for Catalog R-R.



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MACHINE and TOOL BLUE BOOK



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Set 26EX-Gear Measuring Wires, accurate to \pm or $- .000025''$, for common diametral pitch external spur gears.

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- ... tables of comparative measurement over three sizes of wires for use in involute profile checking.

CATALOG and HANDBOOK No. 35 is available without charge by writing to: The Van Keuren Co., 177 Waltham St., Watertown, Mass. Ask for your copy.



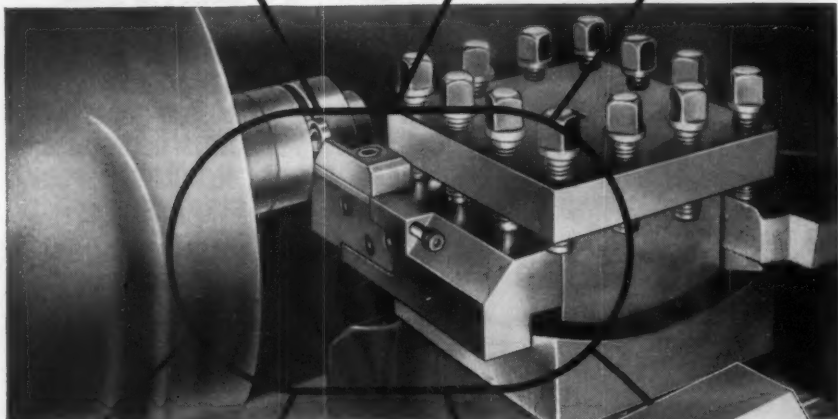
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Featured **IN THIS ISSUE**

Interview with Charles A. Cheyne	85
Welding Heavy Bull Gears	112
Simplified Drafting	122

Standard Heavy Duty Lathe Converted for Trepanning: Increases Production 200%, by A. G. Haglund, Dir. of Mfg., Axelson Mfg. Co. The author's company formerly drilled a 3" dia. x 14" deep hole in one hour. Now trepanned in one operation, the job is done in just 20 minutes. A 1½"x14" core, suitable for making other parts, is salvaged. **Page** 91

Jig for Close-Center Holes, by C. T. Bower, Consulting Tool Engineer. The problem of drilling small closely spaced holes in bulky components is solved through the use of a jig with built-in hole spacing gear. There is no aligning of the drill with holes in a jig plate. **Page** 96

New Horizons of Efficiency with Vibration Control, by Edward A. Johnson, Vice-President, The Barry Corp. Shock and vibration control lowers reject rates and maintenance expense, makes possible straight-line production, minimum of materials handling. It also permits savings in the construction of new plant facilities, lessens noise. **Page** 100

Ford Solves Critical Compressor Disc Problem. Machining compressor discs for the world's most powerful production jet engine posed a difficult problem. The semi-production department of Ford Aircraft En-

gine Division solved it by converting an obsolete crankshaft lathe to an efficient contour finishing machine. Result: 75% decrease in setup time; 50% increase in production; improved quality; negligible scrap loss. **Page** 110

Welding Heavy Bull Gears, by Charles N. Aronson, President and Chief Engineer, Aronson Machine Co. Bull gears almost three feet in diameter, requiring nine welds, are produced by the author's company using semi-automatic welding equipment and a specially designed rig. for easy manipulation. **Page** 112

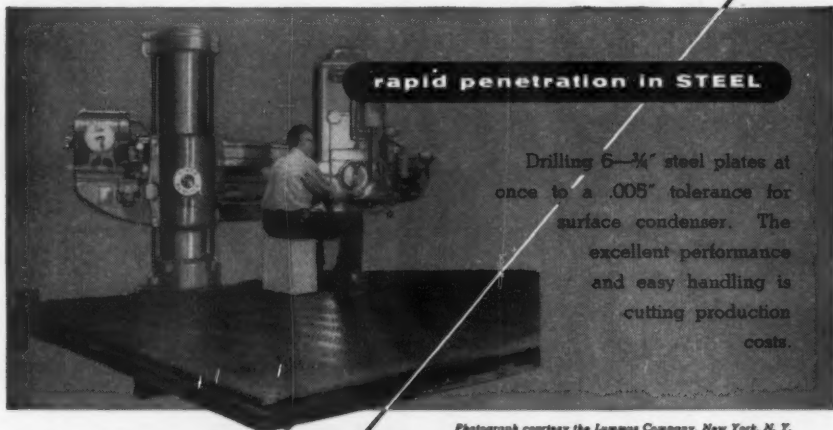
Simplified Drafting Boosts Drawing Room Productivity, by J. G. S. Billingsley, Assoc. Prof., Mech. Eng., Norwich University. Drafting room production has lagged far behind other divisions of the plant. Without increasing manufacturing costs, simplified drawings can result in savings up to 40%. **Page** 122

Paper Weight Stenciled in One Chucking Operation, by D. A. Rogers, President, Dayton Rogers Mfg. Co. Only one chucking operation was required to stencil a six-word inscription on a paper weight, using a combination knurling and stenciling tool. The same principle can be applied to stenciling screw machine products. **Page** 138

rapid drilling with ACCURACY saves money

AT THE LUMMUS COMPANY

On jobs like these the ease of control, the accuracy and the outstanding speed of penetration of Cincinnati Bickford Radial Drills pay big dividends.



rapid penetration in STEEL

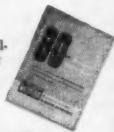
Drilling 6- $\frac{3}{4}$ " steel plates at once to a .005" tolerance for surface condenser. The excellent performance and easy handling is cutting production costs.

Photograph courtesy the Lummus Company, New York, N. Y.

rapid penetration in BRASS

Drilling 4 brass tube sheets, 1 $\frac{1}{2}$ " thick, simultaneously to a .002" tolerance, a special spiral brass drill penetrates at the rate of 10" per minute.

Of interest to every user of Drilling Machines—Write for your copy of 80-year Anniversary Booklet.



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THE CINCINNATI BICKFORD TOOL CO.

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MACHINE and TOOL BLUE BOOK

AS THE

Editor

SEES IT

Romulus and Remus

At one time in our history the labor and union movement were twins, much like Romulus and Remus. The twins were exposed to death by a wicked brother, but were saved at the last minute by a royal herdsman and raised by him. In due course Romulus founded Rome and killed his brother Remus.

Romulus, a despot, invited slaves, fugitives from justice and other crum bums to populate his city. Taking proper care of his fugitive friends he abducted the Sabine maidens while they were attending a festival in Rome. This occasioned a war, terminated only by the women themselves.

Rumor has it, and probably true, that Romulus was torn to pieces by his councilors.

It doesn't take much imagination to observe a similarity between some unions and labor and Romulus and Remus. No one will say much against the labor force. They mean well and are loyal citizens. There is nothing frighteningly wrong with labor or the labor movement.

Some unions, unfortunately, are becoming another matter. They appear to be growing fatter and becoming more bloated each year. Each year the

dividing line between them and labor becomes sharper. They become more interested in themselves and less in labor whom they are supposed to represent. Too many irresponsible, and sometimes despotic union leaders have made a farce out of the labor movement. And yet, no man can make such a statement without drawing attention to many able and conscientious union leaders who have both the welfare of labor and management at heart.

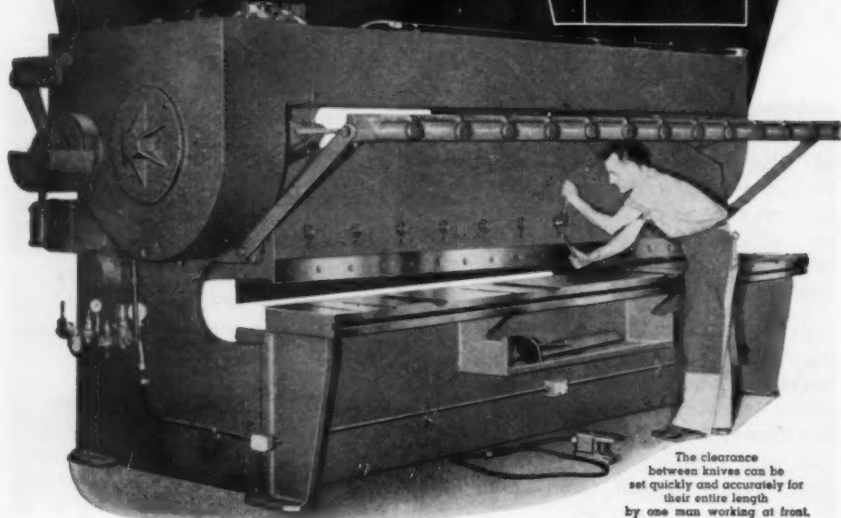
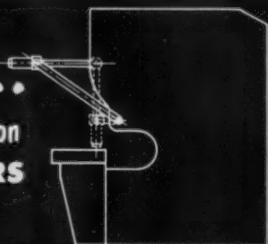
However, a large share of the trouble which the labor force experiences with selfish union leadership is of their own doing. They do not attend meetings, take no interest in the running of affairs, raise no unified voice of protest, and generally are lead around the courtyard like so many sheep. Everyone knows of strikes called by union leaders which did not have the complete sanction of the rank and file. Yet the strikes were called and continued to the great loss of labor and management.

Maybe if Remus had been more vociferous and had resisted by putting on a good show of his own Romulus might not have gotten his way and much subsequent suffering could have avoided.

Editor

Knife Adjustment...

Easy and Convenient on
STEELWELD SHEARS



The clearance between knives can be set quickly and accurately for their entire length by one man working at front.

When the knives on a Steelweld Shear are being set parallel from one end to the other, it is not necessary to have one man at the rear of the machine turning adjustment bolts, with another man at the front gauging the knife clearance. Nor is it necessary to work between or behind the hold-downs in hard-to-reach places.

On Steelwelds the hold-down beam can be lifted out of the way and all knife adjustment bolts reached from the front of the machine. As each bolt is turned, the clearance can be checked

at once. One man can make the entire adjustment in a small fraction of the time usually required.

After the knives have been set for parallel, the clearance between them can be adjusted to suit various plate thicknesses to obtain the best possible cuts. This can be done in a few seconds by turning a crank and watching a dial indicator.

Because knife adjustments have been made so convenient on Steelwelds, shear operators will make them gladly and without hesitation. This contributes greatly to accuracy and quality of cuts and assures long knife life.



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CATALOG No. 29 gives construction and engineering details. Profusely illustrated.

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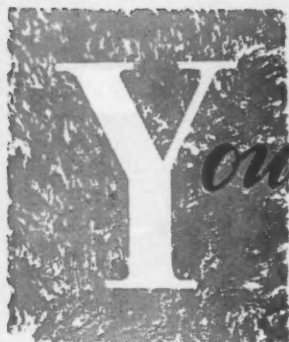
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MACHINE and TOOL BLUE BOOK



Yours very truly!

Letters to the Editor

Time Study

We have read the last of your series of articles in the MACHINE and TOOL BLUE BOOK and have ordered four complete sets of these from the magazine when they publish it. From the one article we read we wanted to write you and tell you personally that it was one of the finest, if not the finest, that we have ever seen.

We believe it is outstanding because you have made no attempt to *sell* time study, but instead you made a sincere, realistic discussion of both the good and bad sides of the matter.

We are in a position to see both sides of the time study problem, as you will note from the bulletin attached describing our WORKOMETER for work measurement. We thought you would be interested in reading about this means of measuring work and trust you will forgive the liberty we have taken in forwarding it to you.

Again we want to thank you for your forthright approach to time study and its limitations and believe your discussion should prove valuable to everyone in the field.

D. R. Stewart
Stewart Instrument Company

A friend introduced me to your publication a few days ago. It was a pleasant surprise to find such a variety of articles under one cover. Of particular interest was one of the series of Mr. Nissley's Time Study articles. If they are available, I would like tear sheets of the complete series . . .

Charles E. Owen, Industrial Eng.
Hydraulic Drives Dept.
Westinghouse Electric Corp.

. . . Keep them up.

W. V. Bergon
Supervisor, Time & Motion Study
Bonded Abrasives Div.
The Carborundum Co.

Your March 1955 issue tells me that you are reprinting Mr. Harold R. Nissley's articles in time study.

Since Mr. Nissley's articles are by far the most complete and outstanding reference material which I have ever seen, I would appreciate receiving a copy of the reprint, when ready.

Frank Lakowitz
Manufacturing Mgr.
Fredric Flader, Inc.

After reading the very interesting articles on time study in your book, I would appreciate it very much if you would forward me a complete booklet

MAXIMUM SAFETY AND WORK EFFICIENCY

NEW CONCEPT IN PRESS BRAKE DESIGN

NEW! di-acro

Hydraulic

Press Brake with

*** STROKE CONTROL**



*** STROKE CONTROL** means that you set the most practical length of stroke for each job—60 strokes per minute at $\frac{1}{4}$ " stroke, 24 strokes per minute at $1\frac{1}{2}$ " stroke. The cam shaft does not make a full revolution as is true with flywheel driven press brakes.

Regardless of length of stroke used, the ram speed is always constant to insure

safe, smooth, efficient operation. No violent whipping action of material.

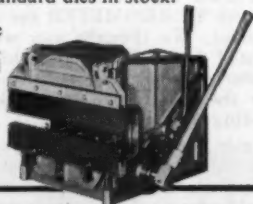
Twelve tons of smooth hydraulic power is applied through a mechanical cam drive which assures perfect, positive alignment of bed. Ram can be "inched" or immediately backed-off. Capacity is 16 gauge steel across 36" bed. Wide variety of standard dies in stock.

For short run or experimental work use the Di-Acro hand operated Press Brake. Eight tons of power forms 16 gauge steel across the 24" bed. Uses standard dies.

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314 8th AVENUE, LAKE CITY, MINN.

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MACHINE and TOOL BLUE BOOK

when finished.

As a Time Study Engineer and at the present time a Mechanical Scheduler I believe it would be of great interest and help to me.

John Zoppetti,
Mechanical Dept. Scheduler
Armstrong Cork Co.

... I have found his Time Study articles extremely interesting and good material to incorporate into a training manual.

Robert Berlin, Time Study Eng.
Modine Mfg. Co.

... When reprints of the complete series are finished, I would appreciate receiving a copy.

I have also received my copy of the 1955 Hitchcock's Machine and Tool Directory which is even better than last year's.

Joseph J. Z. Cronan
Time Study Dept.
Chain Belt Co.,
Roller Chain Div.

Information, Please

We are in the process of mechanizing an assembly operation and would like to receive your suggestions naming companies that might be in a position to supply standard equipment or equipment that could be modified to meet our requirements.

The equipment could be called a pin gun or pin driver, but in order to interpret this name correctly, I will describe the problem and the equipment we visualize as necessary.

At present, steel pins are being hammered manually into a blind hole drilled in cast iron. The pins are nominally 5/32 inch in diameter and 5/8 inch long, and are made from special steel wire; they are headless, and both ends are identical and ball pointed. The blind holes are drilled for a light drive fit and approximately 5/16 inch deep. The casting is an irregular shape approximately 4 feet square on the top surface.

In order to mechanize this job, we envision a hopper- or cartridge-fed, portable hand tool that will permit the operator to drive approximately 60 pins per minute. If a hopper is used, it could be suspended from overhead beams. The pin driver could also be suspended by springs or counterbalanced from the same

overhead beams.

Charles E. Smith
Asst. Consulting Eng.
Mechanical Eng. Div.
Battelle Memorial Institute

If a reader can help Mr. Smith we're sure he'll appreciate it.

We would appreciate very much knowing if you can refer us to the name of some company which we believe is the Ed Sulger Mfg. Co., who manufactures a Universal Drill Jig which is known as a Model "K" and a Model "G," and under the trade name of Reglus . . .

Cecil Brown
Hart Industrial Supply Co.

Sorry! Looked high and low but am unable to help. Can somebody help reader Brown?

About 15 years ago before entering business, working for the Navy Dept., we used a thread grinding block, which holds a ground tool bit and enables you to grind a U. S. Std. and Acme Std. thread tool or bit with the proper angle and clearance. This block is used on the magnetic chuck on the surface grinder. It was made by J. Jorgensen, Bridgeport, Conn.

I wrote to the company at this address and the letter was returned . . . I need one each of these blocks for grinding thread tools.

H. L. Dickerson
Dickerson Machine & Tool

We are interested in finding out the name of a manufacturer of automatic wire mesh weaving machines.

The type machine we are looking for was manufactured by the McCallip Mfg. Co. of Columbus, Ohio. We have tried contacting them, but our letter was returned "unclaimed."

A. Berger
Acorn Mfg. Co., Inc.

Information sent.

Interview

I have read with great interest your interview with America's great industrialist, James F. Lincoln. If possible, I should like to obtain a copy of the May issue containing that article. . .

Tom D. Crocker
Engineering Purchasing,
Aeronautical Div.
Minneapolis-Honeywell
Regulator Co.

Copy sent.



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. . . see how YOU CAN DO
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1839 Reading Road
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Capital Roundup

by Arnold Kruckman,

Blue Book Washington Correspondent

Definition of "Automation"

Automation is a live subject of discussion by officials of the Federal Government, especially by those who have to do with the heavier industries. For a new Webster's dictionary, many leaders have helped to provide a definition of the word "automation."

K. L. Finkenstaedt, machine tool designer of Rockford, Ill., phrased it: "Materials handling in a timed relationship with some other major movement." R. H. Sullivan, vice-president, Ford Motor Co., Dearborn, Mich., provides these words: "Improved machinery and more productive tools to do the work that man formerly had to sweat to do." The third quotation was supplied by Benjamin F. Fairless, former chairman of the United Steel Corp., Pittsburgh, Pa.: "Among engineers who coined it, the word automation is merely a term which conveniently describes certain mechanical controls and processes."

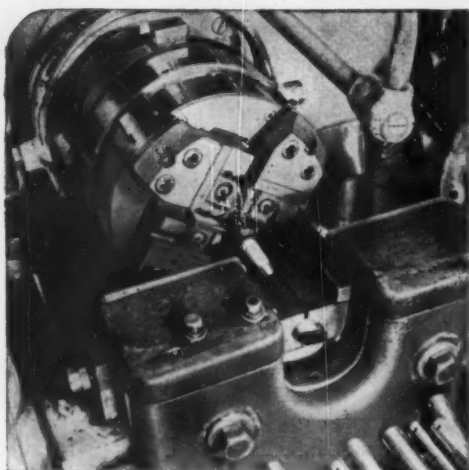
The lexicographer, finally, puts it this way: "Automation, noun. 1. The act or technique of having a manufacturing process fully automatic. By this

- automation accepted by all industry and most workers
- congress criticized for lack of sufficient consideration of bills
- impossible to balance budget in next 5-10 years
- business improves since first of April
- machine tool loans made to foreign countries

technique, parts are moved into and out of machines without being handled by human operators. 2. The state of being automatic. 3. Automatic operation, as of a machine. Automation has developed to the point suggested in the lexicographers' definition, and in the matter-of-fact acceptance by all industry, and by most workers.

Labor's View of Automation

Of course the Walter Reuther school of thought inherent in labor philosophy still opposes the idea wherever it is possible in order to lessen its impact. However it is Walter Reuther who has recently said: "Nothing could be more wicked or foolish than to restrict re-



BOLTS

threaded
to $\pm .001$

on a Landmaco Machine

Using LANDIS Threading Equipment, the Chicago Screw Company of Bellwood, Illinois, is able to thread connecting rod bolts to better than Class 4 fit at normal production rates and economical tool cost.

Bolt blanks are of 8640 steel of 30-36 Rockwell "C" hardness. 11/16" diameter 16 pitch UN form threads must be cut 1-7/16" long over a cotter key hole. Specifications required a $\pm .001$ " tolerance on the Pitch Diameter of the thread, and finished threads are closely inspected for concentricity.

To perform this operation a 1 1/2" LANDMACO Double-Spindle Threading Machine equipped with Leadscrew, Hardened and Ground LANCO Heads, and Chasers of special throat length and hardness was installed. In normal production, this LANDMACO Machine regularly completes 127 threaded pieces per hour cutting at 15 surface feet per minute. On an average 400 threads per head are produced between each regrinding of the chasers.

This installation illustrates the production advantages of LANDIS Equipment for difficult and exacting threading operations. The mechanically-controlled positive feed of the Leadscrew, the maximum rigidity of Die Heads designed for precision threading, and Chasers of special specifications—allow threading hard material with minimum cutting strain. As a result, threads are produced to close tolerances at economical production rates and low tool cost.

For further information, ask for Bulletin H-75 (LANDMACO Machines) and F-80 (Hardened and Ground Heads). Please send specifications when writing.

388-MC

LANDIS Machine company

WAYNESBORO • PENNSYLVANIA • U. S. A.

A redesigned model of this equipment in operation at:



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MACHINE and TOOL BLUE BOOK

placement of men by machines. You can't stop technological progress and it would be silly to try it if you could.

"There will be no debate between ourselves and management in that field. The only question is going to come over the division of the resulting wealth. We will never question whether we want a big or little pie of national wealth to divide, or deviate from our conviction that the big pie is always the easiest to split."

Automation Investigation Proposed

To this Correspondent it seems the most interesting and useful suggestion regarding automation has come from Richard F. Blaisdell, one of the Metal and Metallurgy Equipment group of the Business and Defense Services Administration in the Department of Commerce. Blaisdell points out that practically all discussion eventually emphasizes two points: Where do the personnel go that have been employed in a plant that is automated; and how is the increased take divided among management and workers? Blaisdell thinks that it would be extremely valuable if sources outside of Government, preferably entirely private sources, would make a plan and organize and finance a method by which these questions could be investigated in outstanding instances of automation. He feels certain that the results would overwhelmingly justify automation in all its relations to men and to the operations to which it is applied in industry.

It is quite obvious that it is in his mind that the best support and activation for such an investigation should come from some large publishing organization that is particularly interested in men and industry and ma-

chines, and whose report would be beyond question as to integrity and honesty of presentation. It is interesting that no source—and there are many interested in the Capital—would have the Federal Government or any other Government unit undertake such a survey.

Congressional News and Views

Senate and House leaders hope that Congress will adjourn by the first of August.

No one actually knows today in Washington the real difference between one Party and another, except that one is a very conservative group regardless of the Party label, and the other is Liberal running to ultra-radical. Obviously, the division will probably be crystallized within the next twelve months.

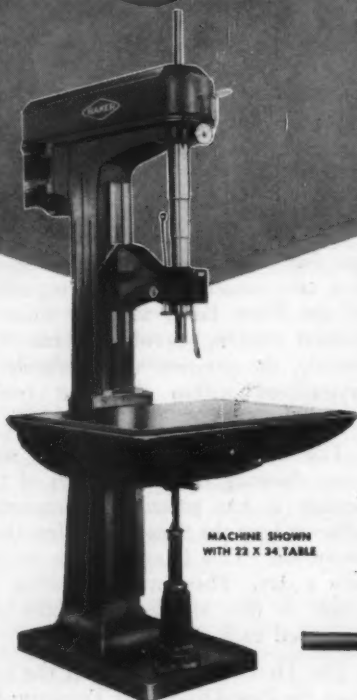
The Senate has produced a summary showing that in 58 days of this Session it has passed 117 important bills—at least the Senate considers them important. This is an average of two bills a day. They intend to whip up action so that at least four bills will be passed each day.

The House has acted upon the bills from the Post Office and Treasury; for the Departments of Labor, Health, Education and Welfare; Interior; Agriculture; State; Justice and Judiciary; Independent Offices; Defense, and District of Columbia. The most general criticism of the work of Congress is that it has been interested mainly in the volume of legislation it turned out rather than the quality—meaning that it rushed through a lot of bills and that it did not do very much thinking or spend very much consideration upon

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- ★ PRELOADED SPINDLE (See Cutaway)
- ★ TWO PIECE FRAME CONSTRUCTION FOR FLEXIBILITY



MACHINE SHOWN
WITH 22 X 34 TABLE

The Baker line of drilling and boring machines is now more complete than ever before, with the addition of the new Baker Sensitive. Baker's 75 years of engineering experience in the drilling and boring field is now at your disposal in light-duty sensitive type units. The machine illustrated is best for light-duty drilling operations. Let Baker Representatives tell you how the Baker will save you money and put you ahead of competition.



Cutaway shows why the Baker spindle preloading prolongs drill life. Ball bearings also lengthen tool life. These, and many other features mean money to you.

GENERAL SPECIFICATIONS KTVS VERTICAL MOTOR DRIVE

1" CAPACITY IN CAST IRON, 1/2" IN STEEL

Spindle centerline to column face.....	12"
Spindle speeds—with 1200 R.P.M. motor.....	273-1375*
Spindle travel.....	7"
Rock travel.....	10"
Table adjustment.....	32 1/2"
Morse Taper in spindle nose.....	3/2 or 3/3

*Speed adjustment between the lowest and highest speed is INFINITE through selector.

BAKER BROTHERS, Inc.

TOLEDO, OHIO

DRILLING...TAPPING...KEYSEATING...CONTOUR GRINDING MACHINES

most of them. The Congressional leaders, on the other hand, constantly stress the expeditious enactment of the laws, and cite that speed has apparently been very popular with the White House.

House and Senate gave the President the legislation he wanted authorizing the use of Armed Forces in defense of Formosa and the Pescadores; giving him the authority to rush to Congress new Governmental reorganization plans; raising the salaries of the Members of Congress, the Federal Judges and United States Attorneys.

Refugee Admittance Law Pressed

The latest novelty in legislation urged by the White House is the proposed law admitting a large number of refugees from all parts of the world. Undoubtedly that bill will be passed, as will the Reciprocal Trade Agreements program, and the bill which will maintain existing excise levies and corporation income tax rates; and providing incentive pay increase and allowances for members of the Armed Forces.

Federal Spending Continues High

The Council of State Chambers of Commerce late in May issued a very interesting statement pointing out there is a decided renewal of uptrend in Federal spending which makes impossible any effort to balance the nation's Budget in the next five to ten years, and give the taxpayers any needed reduction. The Council particularly stresses that in addition to funds already appropriated in this Session, and the \$9 billion unexpended from the last Budget, the new demands total \$3.5 billion for new foreign aid funds; also \$8 billion for Federal aid money for school construction; and a huge sum as Federal aid

to build highways. It is pointed out that this very swiftly will make a substantial increase in the \$275 billion ceiling on the public debt.

Presidential Candidate Speculation

Walter Chamblin, Jr., vice-president, National Association of Manufacturers, in charge of Government relations, has publicly announced that he and many others in Washington expect that CIO Chief Walter Reuther may be the Presidential candidate on a combined Labor-Democratic ticket in 1960. Chamblin is convinced the CIO slowly but surely is taking over control of the Democratic Party.

Business Improves

All Federal Agencies concerned with observation of industry and general business report there has been an upswing since the first of April. They tell us that we have now exceeded the peak figures of 1953. In the half year just passed the nation's output of goods and services rose \$13.5 billion, from \$355.5 billion to \$369 billion in the first quarter of this year. They ascribe the recovery to consumers' ability and willingness to buy. Between summer of 1954 and the first three months of 1955, consumers increased their rate of spending by more than \$7 billion.

Detroit Area Earnings Revealed

The U. S. Department of Labor at Chicago reported recently the results of a survey of 46 machine tool and accessory establishments in the Detroit area. Total employment in these establishments was 6,572 persons. Skilled workers, such as electricians, inspectors, machine tool operators and tool and die makers had average hourly earnings ranging from \$2.13 to \$2.60. Main-

Serving the Industry Since 1852

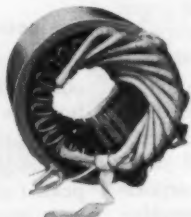


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Slipping belts and defective motors may be costing you more than you think! At surprisingly small expense, highly efficient ball bearing Wood's Motor Arbors or Shaftless Motors can be installed to provide real economy and top performance.

Precision-Built and "full tape insulated", these exceptional motors are available in a wide variety of types and range from one to one hundred horse power—or will be built to your own specifications.

Write today for descriptive material or ask our Engineering Department for the solution of any special motor problem.

MOTOR DIVISION

S. A. WOODS MACHINE CO.
27 DAMRELL STREET
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tenance electricians were paid \$2.60 an hour; machine tool operators, Class A, received \$2.44 an hour; machine tool operators, Class B, received \$2.14 an hour. Tool and die makers, other than those employed in tool and die jobbing shops, are listed at \$2.59 an hour. Women inspectors, Class C, received \$1.83 an hour. These figures are as of January, 1955, and cover production shops. In the same area, at the same time, a survey in jobbing shops covered 20,238 workers in 466 establishments. Machine tool operators are listed as receiving \$2.98 an hour; tool and die makers \$3.01 an hour, and welders, Class A, \$2.79 an hour. In the Chicago area the survey covered 5,185 production shop workers, machine tool operators receiving \$2.43 an hour; Class B operators receiving \$2.06 an hour. The various other classifications range from \$1.96 an hour upwards.

Foreign Operations Administration Disbands

Foreign Operations Administration went out of business during June. Its powers, authorities and functions were transferred to the Department of State, thereby adding the State Department to Departments like Post Office, Agriculture, Labor, and other huge Government Agencies invested with vast banking powers and authorities. All Departments, Agencies and other Sections of Federal Government are striving to secure authority to act with banking powers.

Foreign Countries Get Loans For Machine Tools

As a final gesture FOA made a number of loans to various countries to procure machine tools. Formosa, which recently complained vigorously that we had not provided sufficient airplane

equipment, was given \$1 million to buy machine tools in any country except the United States in one instance; shortly thereafter it was presented with \$40,000 to procure machine tools as equipment for its naval repair shop. In this instance, the authority was to procure them anywhere the Formosans might elect. Shortly thereafter they were presented with \$25,000 to procure machine tools wherever they chose. The last allotment was \$8,500 to be spent wherever the Formosans saw fit.

During this same period Egypt was presented with \$11,360 to purchase machine tools anywhere through the Agency of the U. S. Bureau of Public Roads. Bolivia, in one instance, received \$20,200 to purchase machine tools wherever it saw fit. Thailand received authority to purchase \$16,500 worth of machine tools; Indonesia, \$131,000 worth; Spain received an allocation of \$750,000 for machine tools to be purchased anywhere in Europe; Turkey was given \$125,000 in one instance and \$25,000 in another. The Philippines received \$1.016 million and India \$85,000.



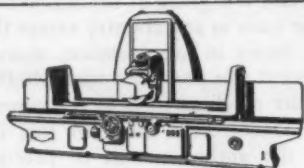
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*If it's a Flat Surface to Grind
There's a Mattison to Grind it.*

• Mattison now is in a position to work with you on all your surface, face and disc grinding problems. These machines are made in various types to handle a wide range of work. Experienced fixture engineers are available to give you best production efficiency with Mattison Machines.

For any flat grinding, ask for our recommendations on the proper method and machine for your job. No obligation, of course.

For catalog on all machines, ask for free copy of general bulletin.



Precision Surface Grinders
Horizontal Spindle



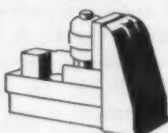
Disc Grinders,
Double Spindle Type



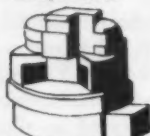
Plane Grinders,
Rotary Table Type



Vertical Spindle
Disc Grinders



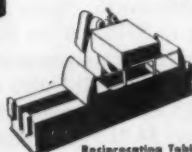
Rotary Table
Surface Grinders



Automatic Rotary
Surface Grinders



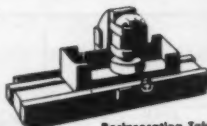
Disc Grinders,
Single Spindle Type



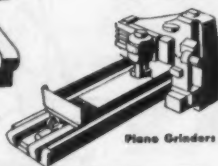
Reciprocating Table
Face Grinders



Reciprocating Table
Surface Grinders
Vertical Spindle



Face Grinders,
Travelling Wheel



Plane Grinders

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MACHINE WORKS



40 hours before—now 4 hours. Pump case ground on Mattison Horizontal Spindle Precision Surface Grinder



230 surfaces of cast iron compression heads per hour, removing 1/32" stock with Mattison No. 24 Rotary Surface Grinder



600 connecting rods per hour, using 40 station fixture to finish grind crank and axial pin and 46 assembled rod with Mattison No. 72 Grinder



Shows variety of work run on Mattison Face Grinders



Leaders

of Thought in Industry

An interview with Charles A. Chayne, vice-president and in charge of engineering, General Motors Corp.

Q. The present competition among auto makers accentuates rated horsepower. How does this influence the purchasers, and what advantage does it give them?

A. Actually, rated horsepower happens to be a term that got into general use over the years because it is a convenient method of indicating the ability of an engine to do what the owner expects the engine to do. But to tell the truth, it isn't the most accurate measure that could be used. An engineer would much prefer to use the term "torque," which is the turning effort that the engine is able to apply to the drive shaft which, in turn, turns the wheels, but torque is very difficult to explain. Horsepower is a term that people seem to understand better, so we use the term "horsepower." The advertised or gross horsepower of the engines in General Motors cars is a figure that is obtained by a standard test procedure used by

all of our divisions. It does in general indicate the ability of the engine to give a driver performance in the range in which he ordinarily drives but, as I said, it isn't the accurate way of indicating that. We design our engines to provide agility in the cars in the speed range where the driver most commonly drives.

As a matter of fact, it isn't generally known, but there are cars on the road today that will not get up to their maximum horsepower in top gear. The only time that you can get the engine to develop its maximum horsepower is in one of the lower gears. That is a situation that has come about because we have used the increased power of our engines to produce not only performance but also economy, so we fit the car with what we call a "fast axle." That means the engine turns slowly with relation to the speed of the car.

This gives you economy, and when you want performance, the automatic transmission permits you to increase the engine speed to car speed ratio, letting the engine go up to higher horsepower output thereby providing performance when you want it.

A most unfortunate result of horsepower advertising is that most people have the impression that we have increased the top speed of our cars in proportion to the horsepower of their engines. I want to say most emphatically that this time is not true. We are not striving for top speed but rather to give our customers economy of operation coupled with performance in the area where it will be most useful to them.

Q. I understand that some car manufacturers have introduced a developed horsepower of 300. Do you think the automobile manufacturer will go further than that with the combustion engine?

A. Predictions in this industry are pretty dangerous, as you well know, but I certainly would not put a ceiling on any of our engineers. I know of no one in the Corporation who would be willing to say "this far you can go and no farther."

G. Is it possible that an all-plastic body for passenger cars will eventually replace steel bodies?

A. Frankly, I doubt it very much. Let me say that the plastic industry is just as dangerous as the automobile industry when it comes to making predictions. Plastics as we know them today have a limited field as far as body structures are concerned. Small production in

specialty cars, yes, and in our styling developments they are extremely useful, but as far as a production car is concerned - by that I mean production in the hundreds of thousands - I don't think they have a place.

Q. Could you explain General Motors' views on the future of gas turbine engine in the automotive industry?

A. We are exploring the gas turbine field very aggressively, but we don't think, in the light of present knowledge, that the turbine is a very useful source of power for the passenger car of the immediate future, but developments are coming pretty rapidly and it is rather difficult again to make predictions. Our guess, and it is purely a guess at the present time, is that it may find its first application in larger vehicles where higher powers are urgently needed - buses and trucks and vehicles of that sort. From what we know today, the accessories for gas turbine take up a great deal of space, while the turbine itself is attractively compact. The intake silencer, the exhaust silencer, and things like that, take up a great deal of space so that, when you look at everything that is necessary to make a complete power plant, it isn't quite as attractive a package as you might think at first glance. But we are working on it very hard and we know that everybody else in the industry is also working on it, so out of the efforts somebody is likely to find out some way to reduce the turbine power plant to a practical form.

Q. Could you give us some problems that are preventing the manufacturer from introducing the gas turbine?



**Charles A.
Chayne**

Charles A. Chayne, vice president of General Motors in charge of its engineering staff, served 14 years as chief engineer of Buick Division before his appointment to his present position.

Born at Harrisburg, Pa., on February 6, 1898, he received his early education at Harrisburg Technical High School and was graduated from the Massachusetts Institute of Technology and Harvard University in 1919 with a bachelor of science degree in mechanical engineering.

After graduation, Mr. Chayne joined the National Advisory Committee for Aeronautics as a junior mechanical engineer. He spent a year in Washington working in the NACA laboratory, then returned to MIT to become an instructor in mechanical engineering.

Mr. Chayne remained at MIT until 1926, then went to the Lycoming Manufacturing Company, Williamsport, Pa., as an experimental engineer. After a year with Lycoming, he moved to the Marmon Automobile Company, Indianapolis, as a power plant designer.

Mr. Chayne joined Buick on January 1, 1930, and was placed in charge of the engine division. He was made assistant chief engineer in 1933, chief engineer in 1936. In January, 1951, he became a vice president of the Corporation in charge of the engineering staff.

A. Well, one of the chief problems, of course, is fuel economy. With the use of heat exchangers economy can be improved, but it still isn't as good as a piston engine. You have the problem of high rotational speeds and high temperatures of parts of the turbine which necessitates the use of special materials and manufacturing processes that are quite expensive, as we know them today.

Q. Also, I would like to ask you about what is the outlook for an all-aluminum engine for passenger cars and trucks?

A. That question requires a rather detailed answer. First - let me say that the design requirements of a light-alloy engine are quite well known. We know what parts have to be made of steel for strength, stiffness or wear, and what parts can be converted to light alloy. It is known that in some spots the greater heat conductivity of light-alloys may give improved results. Many people assume that an aluminum cylinder

head should be an improvement because the walls of the combustion chamber ought to be cooler. Let us consider, for a moment, the combustion chamber of a modern high compression engine. It's pretty compact. A large part of its surface is the head of the piston which is already of aluminum alloy. The remaining surface is valves, spark plug and a relatively small amount of surface between these parts. Well, you cannot change the valves and plugs to light alloy - they would burn up. And you will have to add valve seat inserts for durability and probably spark plug bushings. When you have done this you have not very much surface left to convert - and you would have to add many pounds of light-alloy into the rest of the cylinder head just to get this little bit of "improved" surface.

Then, too, if the head is made of aluminum, that means the exhaust ports will be in aluminum. The hot exhaust gases rushing through these ports will,

because of the greater head conductivity of aluminum, transfer more heat to the cooling water which in turn will require a larger radiator.

When you consider the cylinder bores these have to be of iron or steel or one may chrome plate the aluminum. Obviously, inserted or chrome plated bores are expensive departures from current practice.

I think you appreciate that many of these design requirements will be more expensive than present practice. To this increase in cost must be added the cost of the material itself, which is quite considerable.

I would venture the guess that the weight saving in an aluminum engine might very well prove to be no more than the weight of a ten-year-old youngster and I doubt if the average owner can recognize the difference in performance of his car when he leaves the youngster at home.

The use of light alloys will, however, increase as the economics improve. Developments in foundry technique, the basic cost of the metal, and in machining may well encourage their use—but it will be economics and not performance that does the trick.

Q. Do you think present-day fuels are adequate for the engines produced by the automobile manufacturers?

A. Yes they are. Fuels are improving every day and as they do we are modifying our engines to get the most out of the improved fuels.

Q. Do you fairly well keep in close contact with the oil companies?

A. Yes, we do. They help us by indicating the probable trend in the immediate future and of course we indicate to them what we would like to do with our engines.

This is a situation in which neither the fuel industry nor the motor car industry can move ahead too fast. If either of us does, we will find ourselves with products that cannot be generally used.

Q. Could you explain the problems or reasons why the air-cooled engine is not used in the automobile of today?

A. Oh, I think that is relatively simple. The air-cooled engine is expensive to build because the cylinders have to, as far as we know today, be cast separately. The fins are very fragile, they require very careful handling in the factories and, because the cylinders are not in a block, you cannot produce as rigid, and therefore as quiet, an engine as you can produce in the water-cooled type. The air-cooled engine would definitely be larger because you have to provide more space for fins than you have to provide for the cooling water.

Q. Then it would actually be more expensive to produce?

A. That is right.

Q. Are the foreign sports cars better engineered than American models and, if so, what does General Motors plan in the future for this type of car?

A. Well, let me answer your question this way. The sports car of today would not be possible without the develop-

ments that have taken place in the passenger car industry. The much vaunted road holding ability of these sports cars is accomplished by the use of suspension characteristics that have been developed in the passenger car field. Frankly, the field seems to be quite limited, and we do not feel that there is any justification for spending the engineers' time on such a highly specialized vehicle that has, at best, a limited market.

Q. Would it be true then to say that the sports car comes in the custom luxury field, where you cannot get down to mass production?

A. I think so.

Q. Does General Motors plan to continue building them in the future?

A. We expect to continue the Corvette.

Q. What advances have been made in recent years in safety glass?

A. Well, I think the biggest advance came some years back when we got a filler for the sandwich that did not change color. You will recall the early safety glass that got quite amber in color when exposed to the sun. I assume from your question that you were referring to advances from the safety standpoint.

Q. Are the machine tool builders keeping pace with your industry for high production equipment?

A. I don't think anybody will ever ad-

mit that he is completely satisfied with what he gets out of a machine, but - speaking as an engineer - I can say that we are very enthusiastic about the improvement that is being made in the accurate reproduction of pieces in high production quantities. We get more pieces to closer tolerances which, of course, permits us to do more design-wise than when we have to allow for very wide variations in machining. Of course, there is always the problem too that the more elaborate the equipment the more costly to change the design—that is a bit of a handicap sometimes.

Q. Would you give us some problems that are facing you from day to day in the engineering of an automobile?

A. I think our biggest problem today is to make progress along the lines on which we have been working for many years in giving the owner cars that are easier to drive, more responsive to his will, and to do so with cars that are more economical to drive. There is much work to be done on engines and also on transmissions. We haven't reached the end of the road on either of these. There is a great deal of work to be done on suspensions. While we think today's cars ride very well, we cannot be satisfied with them. There is a great deal of work to be done on brakes, of course, and there is always the problem that concerns us very seriously that the easier you make the car for the owner to drive at the same time you make it easier for him to misdrive it, if you will. So that entirely aside from the design there is a great deal of work to be done in driver education.



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Encircle No. 276 on Card, Opposite Page 65

Standard Heavy Duty Lathe Converted for Trepanning: Increases Production 200%

THERE ARE numerous methods for opening a large hole in solid steel forgings—but none more economical, nor gaining wider acceptance than trepanning.

Example: To machine a 3" diameter x 14" deep hole in an alloy forged steel landing strut, Axelson Manufacturing Co. formerly drilled a 2 $\frac{7}{8}$ " diameter hole, then finish bored to 3.094 inches. Time: one hour.

The same piece, trepanned in one operation, now gets the job done in just 20 minutes, floor-to-floor time, and salvages a usable 1 $\frac{1}{2}$ " x 14" core, suitable for making other parts. Production is increased 200%.

Involved are two significant developments: (1) standard trepanning attachments that will convert any new Axelson heavy duty engine lathe for trepanning; (2) a second or double trepanning head for large diameter bores.

Trepanning can be traced to ancient Egyptian surgeons who "cored" out a small piece of skull during early brain

By **A. G. Haglund**, Director of Mfg., Axelson Manufacturing Company, Division of U.S. Industries, Inc., Los Angeles, California as told to **James Joseph**

operations. More recently, however, trepanning has been widely used to bore long holes such as gun barrels, etc., with great accuracy. Axelson's trepanning method adds one more important job to the many already possible on standard lathes.

The lathe's trepanning unit includes: (1) bar holder that bolts to the carriage wings after removing the cross slide and compound; (2) a high pressure coolant system; (3) two standard steady rests; (4) a special hollow boring bar with removable trepanning heads; and

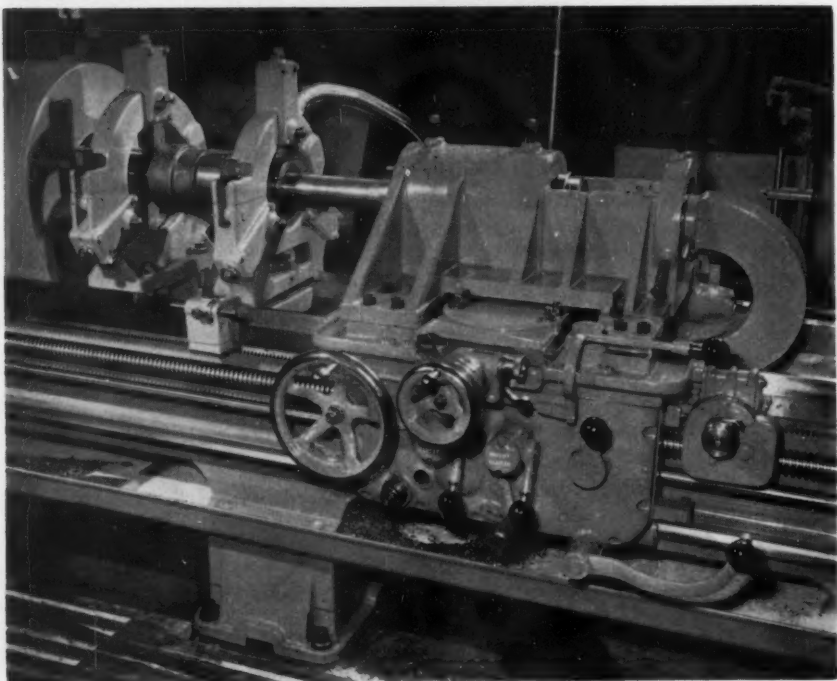


(5) a revolving packing gland with "O" ring seals for supplying coolant to the cutting head.

A typical job concerns an elbow-shaped aircraft landing strut forged from alloy forged steel. The part comes to the lathe with one arm of the elbow and an end drilled, the end with a two-inch diameter hole. This end is placed over a two-inch diameter plug held in the chuck, centering the part. A work-holding fixture bolted to T-slots in the chuck face holds the part rigid.

Axelson 20" heavy duty lathe with high pressure coolant motor and piping system, foreground

Trepanning head, with steady rests and other additions designed for lathe





Trepanning head, close-up, showing carbide tool, chip breakers, etc.

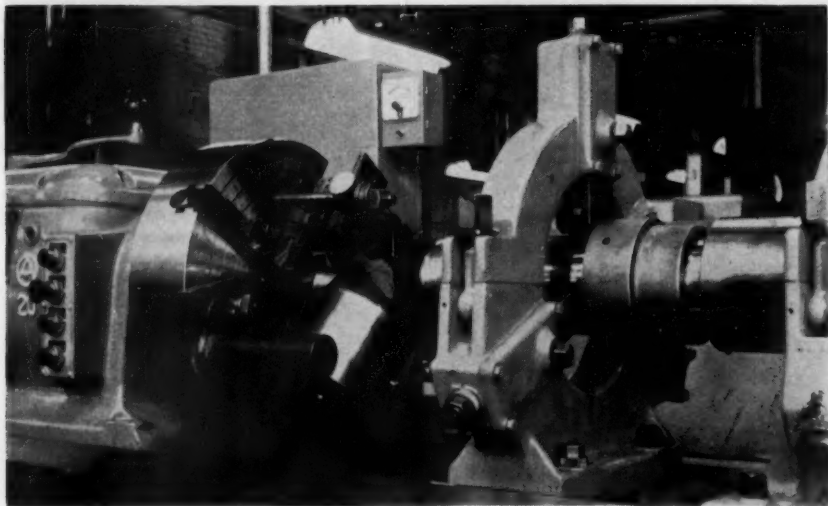
In operation, a flexible coolant hose connects to the stationary side of the revolving packing gland and directs coolant (at 130 gpm, 180 psi) from the 10 hp high pressure pumping unit to the cutting head. The coolant is a soluble cutting oil mixed 12:1 to give

proper lubricating properties. The high pressure assists in breaking up chips and carrying them out through the hollow boring bar.

The operation's prime advantage lies in the design of the trepanning head which is attached to the end of the hollow bar. Carbide tipped tools and carbide wear strips are used on the cutter head. The trepanning cutter is approximately $\frac{3}{4}$ " wide and actually cuts three chips simultaneously. Chip breakers ground into each of the three steps break the chips into finer pieces so that they can be easily flushed out through the hollow bar. Average trepanning chip is about $\frac{3}{16}$ " long.

Setting up for trepanning is a simple operation and can be handled by the average machinist. Axelson's machinist, Floyd De Pledge, has been on the job only a week, yet he is turning out a trepanned strut in just 20 minutes, floor-to-floor time.

Trepanning setup at Axelson, with load meter, background



The job's specifications:

Machine: Axelson 20" heavy duty lathe

Part: aircraft landing strut

Material: alloy steel forging

Hardness: 30 Rockwell C

Dimensions of Cut: 3" dia. x 14" deep, core 1½" x 14"

Cutting Tools: carbide

Speed: 199 rpm

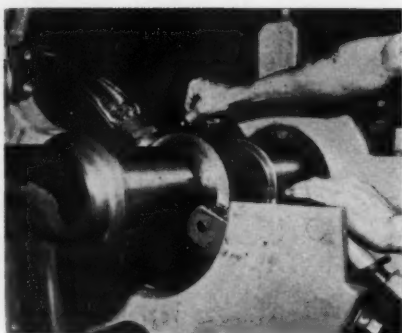
Feed: .006 inch per revolution

Chucking time: 5½ minutes

Actual trepanning time: 12½ minutes

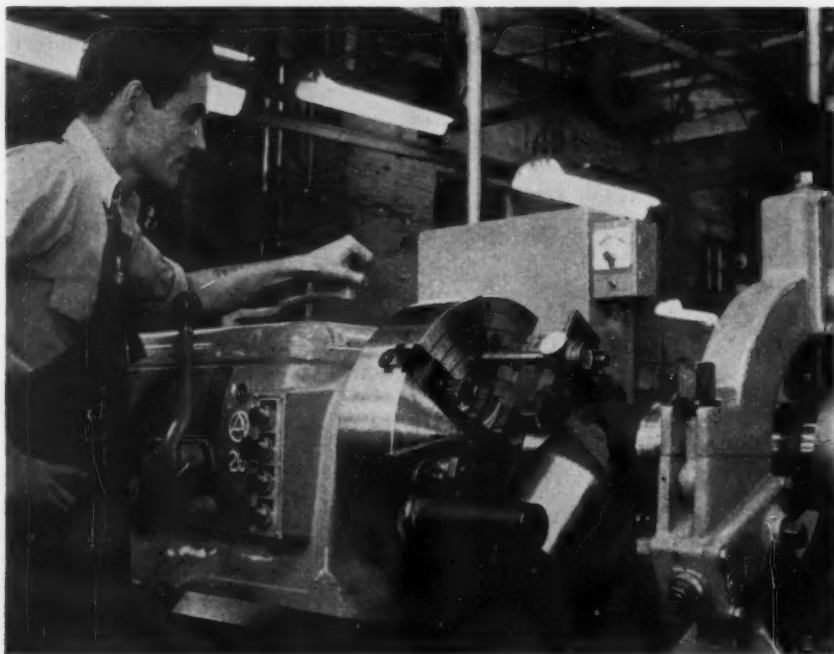
Total floor-to-floor time: 20 minutes

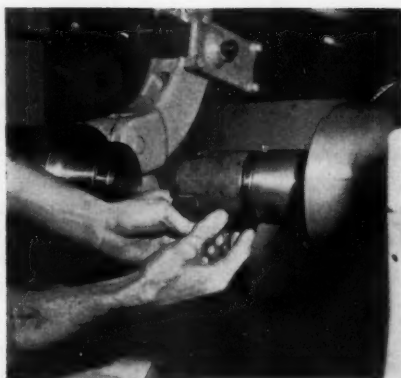
Former floor-to-floor time: 1 hour approximately



Close-up of trepanning setup. Note trepanning head, coolant tube (flexible) to head, pipe for washing away chips

With the elbow strut held in chuck, and the trepanning totally enclosed, operator watches load meter (background), indicating whether cut is progressing as it should





Adjusting the tool during setup

The machine is equipped with a load meter, tied onto the input of the main drive motor and mounted on the headstock where it is visible at all times. The load for normal operation is set on the meter's adjustable hand. Thereafter the operator can see at a glance how the cut is progressing. Should the indicator hand move past this setting, the operator can shut down the machine, avoiding serious damage to the cutter head or boring bar. The load meter indicates such things as tool breakage, chip build-up, dull tools, etc. In the case of dull tools, for instance, chips do not break correctly, thus load up the cutter, preventing the chips from flowing freely through the hollow boring bar.

For a larger diameter bore at the starting end and smaller bore at the other end, Axelson has developed a second or double trepanning cutter head. This head incorporates the standard trepanning cutter and also a boring cutter, set slightly back from the trepanning cutter in the cutter head. In operation the first cutter trepanns a core, the boring cutter increas-



This core is bonus from trepanning process

ing the bore to larger diameter. In this manner, for example, a $3\frac{3}{8}$ " diameter hole can be opened to $5\frac{7}{8}$ " diameter in one cut.

A big feature is the fact that the standard lathe remains unchanged; the tool slide and compound can be replaced, the lathe reconverted to "standard" for more routine shop work.

The End



Jig for Close-Center Holes

By **C. T. Bower**
Consulting Tool Engineer

DRILLING small closely spaced holes in fairly bulky components presents special problems. If the component is small in weight and size, a simple jig plate can be made from hardened tool steel for clamping to the component. Jig plate and component can then be moved into correct position under the revolving twist drill for drilling each hole. If the drill diameter is below 1/16 in. care must be exercised by the drilling machine operator to place the drill accurately over the guide hole in the jig plate, before feeding it downward into the work. Slight malalignment of the drill axis and the jig plate guide hole will be corrected by the revolving drill pulling the jig into line.

If the component is fairly large and must be located in a correspondingly large fixture, there is no hope of a slender twist drill pulling the excessive weight of the two into line: the drill will bend or break. A light radial drilling machine might be used so that the drilling jig and the work stay in one position on the machine table while

Best approach to small hole drilling at close centers in large components is to move work only, rather than move jig and work into line under drill. By building hole spacing gear into jig, work may be moved a predetermined amount. Operator loads and unloads component, feeds drill spindle.

the operator aligns the drill with the guide holes in the jig plate. This would be slow in action since alignment of the drill point with the guide holes in the jig plate would require care and precision from the operator. This, in turn, would increase the rate of fatigue for the operation.

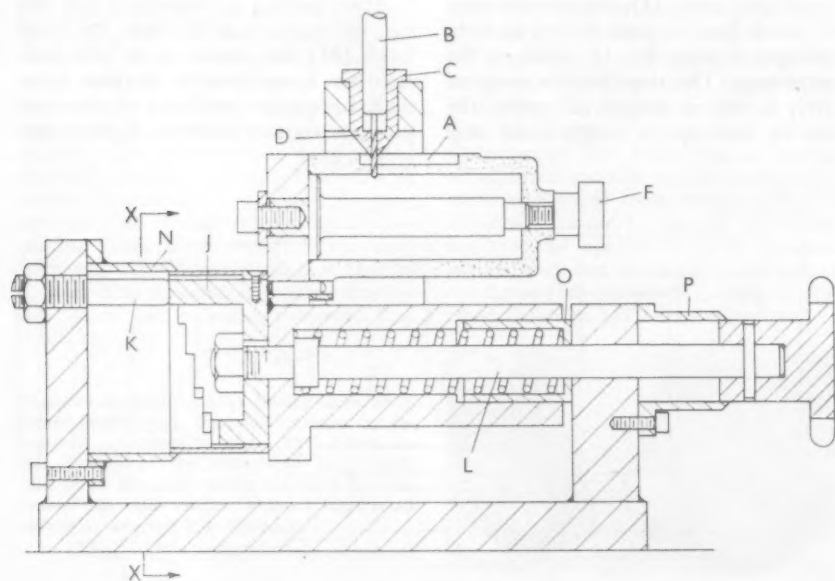
Drilling small holes at close centers in large components requires a different approach to the problem of designing jigs. The spindle center line on most sensitive drilling machines remains in a fixed position, therefore, the work must be moved into position

for drilling the successive holes. Rather than attempt to move the jig and work into line under the drill, it is better to move the work only and to move it through a pre-determined amount by building hole spacing gear into the jig. By adopting this principle, the operator loads and unloads the component and feeds the drill spindle: aligning of the drill with holes in a jig plate is avoided.

A jig designed on the hole spacing principle is illustrated in the drawing. It is intended for drilling 11 holes of 1/16 in. diameter in the bottom of a recess (A) on the wall of a small hydraulic cylinder. This recess is shown enlarged in Section XX. The hole center distance is 7/64 in. therefore, the wall thickness separating two adjacent holes is merely 3/64 in. as shown in the enlarged section through the recess.

The twist drill is strengthened by mounting it in the end of a large diameter mandrel (B) which is guided by the fixed position drill bushing (C). The lower end of the bushing is bored to a running fit for the twist drill and swarf holes (D) are drilled in it to get rid of any chips which work up the drill flutes. The lower end of the guide bushing is conical so that it can project part way into the recess on the work and give maximum support to the drill. The bushing is mounted in an overhanging arm supported by a vertical pillar (E) which is welded to the jig base plate.

Mounting of the component in the jig is self-evident from the drawing. The clamping knob (F) has a threaded stud integral with it for engagement with a tapped hole in the end face of the central pillar. This arrangement is



SECTION X-X



necessary to allow the component to be pulled forward off its locating disc and to drop slightly before the edge of the recess fouls the drill bush.

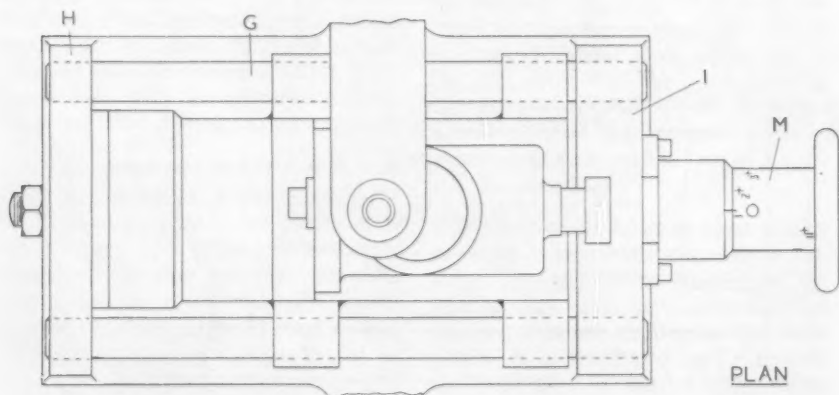
The component mounting is on a small sliding carriage. The slides at either side are cylindrical rods (G) secured at their ends in suitable holes in the end plates (H) and (I) of the jig. Welded lugs on either side of the carriage engage with the slide rods. The carriage is made to slide freely on the rods.

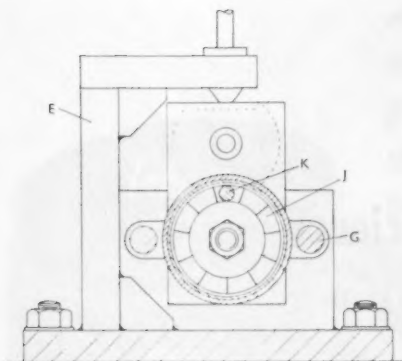
Hole spacing is by means of the cup-shaped piece (J), the narrow edge of which has 11 steps milled in it to correspond with the 11 holes in the component. The steps become progressively lower in height all round the face of the cup. A single fixed stop

pin (K) is mounted on the rear end plate (H) of the jig body and its end bears on the steps in the end face of the cup. As shown in the sectional view, the stop pin end is resting on the top step of the cup edge and the drill is producing the hole on the left hand end of the row in the component. The position of the next hole is indexed by turning the stepped cup through $\frac{1}{11}$ th part of a turn so that the fixed pin is in contact with the next step from the top.

Cup edge and stop pin are held in positive contact with one another by means of the compression spring which is housed within the sliding carriage center line. Through the axis of the compression spring runs the spindle (L) for turning the indexing cup. A serrated knob (M) on the right hand extension of the spindle is turned by the operator.

After loading a component into the jig, the operator pulls back the hand knob (M) and rotates it to hole position No. 1, as shown in the plan view. This brings the end face of the stop pin into contact with the highest step





on the indexing cup as drawn. For drilling the second hole, the operator turns the knob to position No. 2. This brings the next lower step into line with

the indexing pin. The compression spring ensures that the carriage is pushed leftward to hold the step in contact with the pin end.

A feature of this jig is the precautions taken to protect the indexing gear from the harmful effects of swarf and chips. The indexing cup and stop pin are enclosed completely within telescopic tubular covers (N). The right hand end of the compression spring is also fitted with a sliding cup (O) which prevents the ingress of chips into the hole containing the spring. The exterior of the operating knob is machined to a cylindrical shape to fit into a tubular cover (P) secured to the front of the fixture base.

The End

Flame-plating reduces down-time costs

The Nixdorf-Krein Manufacturing Co., St. Louis, Mo., has reduced down-time costs on their wire-forming machines by flame-plating wire straightening rollers with tungsten carbide. Deep grooves worn in unplated rollers by small diameter wires often badly scored larger wires which were passed through the same set-up. The result—costly machine down-time periods were necessary to change rollers. By flame-plating these rollers with tungsten carbide, small and large wires can now be processed in succession without scoring the stock or replacing rollers. The

tungsten carbide coating is left in as-coated condition (similar to fine emery paper) to obtain an effective gripping surface which produces the rotation necessary to avoid excessive wear.

Flame-plating was developed by the Linde Air Products Co., Dept. MTB, 30 E. 42nd St., New York, N.Y., a Division of Union Carbide and Carbon Corporation, for depositing a coating of tungsten carbide on the surfaces of parts and many tools where extra resistance to wear is needed. The coating may be applied to most common metals and can be used in as-coated condition (125 microinches rms) or finished down to 1-5 microinches rms.

These wire straightening rollers have been Flame-Plated with tungsten carbide for increased resistance to wear. The rollers resist "grooving" so effectively that small and large diameter wires can now be processed in succession without replacing rollers or scoring the stock.



New Horizons of Efficiency with Vibration Control

by **Edward A. Johnson**, Vice-Pres.,
The Barry Corp., Watertown, Mass.

EVERY DAY some plant manager, beset with high reject rates and maintenance expense, discovers that his troubles are due in part—often in large part—to vibration or shock. Pulses of energy set up in floors and walls by various types of machinery spread through the plant structure like waves from a stone thrown in a pond. And, just as such waves set floating bits of wood to bobbing, so vibration and shock waves set other equipment to oscillating. Precision grinders mar the workpiece with chatter marks. Machinery adjustments work loose, making tolerances difficult to maintain. Equipment is literally shaken apart with consequent downtime for maintenance.

Such a case was that of the big optical company which was faced with the staggering reject rate of one in every seven precision lenses. A full-scale investigation was launched, and it was discovered that the precision grinders on which the lenses were fin-

Vibration-free plants cut rejects and maintenance, can juggle equipment for best work flow

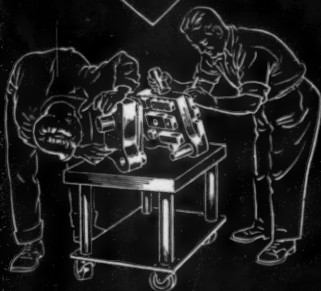
ished were being constantly shaken out of adjustment by the vibration of other equipment.

Properly designed shock mounts and vibration isolators offer a relatively simple and inexpensive solution to costly problems like these. When the optical company installed them under its equipment, the reject rate on lenses dropped to one in 40, an improvement of about 600%.

Of course, these are the extreme cases, the cases where the magnitude of the havoc focuses the attention of management and demands an immediate remedy. But these are by no means the measure of the losses, the costs, the damage sustained each year by industry as a direct result of vibra-

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tion. The less spectacular, still unrecognized cases probably take a much higher toll.

The remedy afforded by mounts and isolators by no means encompasses all the benefits these devices hold for metalworking plants. For, by effectively eliminating vibration and shock, they also make possible a far more efficient plant layout; they simplify and speed the conversion of production lines for model changes, and in the case of new construction they may effect considerable savings in building costs.

Let us examine first some of the many instances where vibration, like a still unsuspected embezzler, is siphoning off profits year after year. These are not like the situation of the optical company already mentioned, or of the Massachusetts plant that had to shut down a grinder every time a train went by. Such obvious and aggravated cases are more analogous to finding the vault door wide open and the contents gone. The cumulative total of many small losses may be greater than a single big loss, and it is this aspect of vibration that until lately has had less attention from industry than it deserves.

Critical Analysis Worthwhile

A reject rate may be comfortably low, but even a single reject represents wasted material, lost effort. The point is that a careful analysis of reject tags may indicate a pattern of causes that point to vibration. Similarly, any machine will go out of adjustment, but what do operators say about the frequency with which adjustments have to be made? How many workpieces end up in the salvage bin for exceeding tolerance limits?

It goes without saying, of course, that vibration is not responsible for every marred or off-size workpiece that comes off the line. Careless wheel dressing, normal operator error and a host of other factors, including ordinary tool wear, probably account for most of them. The over-all pattern, however, may be significant.

Maintenance often provides another clue. Is it greater, more frequent, than normal wear should require? If so, vibration can usually be placed high on the list of suspected causes.

More important, what is this criterion of normal wear? In too many plants a given rate of maintenance tends to become accepted without critical appraisal. For that matter, so do reject rates and downtime for readjustment. It is when these things, however modest, are looked upon as abnormal that the costly effects of vibration begin to take on truer perspective. It is when equipment and processes are evaluated in the light of ideal performance that vibration is often highlighted as a surprisingly big factor in costs.

Excessive vibration and shock originate principally in two kinds of machines: those which involve the impact of relatively heavy masses, and those which include a rotating component. Punch presses and drop forge hammers are typical of the former; lathes, compressors and other large rotating equipment come to mind at once as examples of the latter. In either case waves of energy are transmitted to the floor of the structure and—unless they are dissipated at that point by a properly designed shock or vibration mount—are communicated to other equipment.

IT'S A HAMILTON



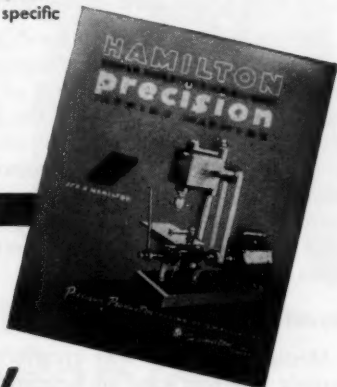
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Encircle No. 278 on Card, Opposite Page 65

Every mass, large or small, hard or soft, has a natural frequency of vibration. When vibrated at this particular frequency, the mass will amplify the vibration. When the natural frequency (or resonant point) of the floor panel in a building is coincident with the natural frequency (or resonant point) of the vibration isolators, both will tend to magnify the vibration and, therefore, severely vibrate the machine mounted on isolators. A great deal of energy is generated which can cause difficulty in many different ways.

When it is remembered that machines consist of a number of component parts, or masses, it is not difficult to visualize what happens when some of these components have the same natural frequency as the pulses of energy transmitted from some distant operation. Rapidly alternating stresses are set up within the equipment, and in time bolts and other fastenings are loosened as the components literally attempt to wrench themselves apart. Abnormal wear, adjustments that won't hold, failures due to metal fatigue are some of the results.

Present levels of maintenance expense and downtime may be taken for granted because they do not seem out of line with past experience, but in the light of what is now feasible in the way of vibration control, past experience is an unreliable yardstick. Today, cost-conscious, efficiency-minded management is beginning to think more in terms of ideal conditions.

Layout Becomes Flexible

Mentioned earlier was another and entirely different kind of benefit from vibration control. This is the cost-saving advantage of mobility—freedom to lo-

cate equipment for straight-line production and a minimum of materials handling.

This modern concept is often thwarted by a conventional plant layout in which heavy impact machinery is kept as far as possible from precision equipment. Thus, in multi-story plants, milling machines, punch presses and similar tools are always located in the basement or on the first floor. In one-story plants they are generally at one end.

From the standpoint of work flow and materials handling, this arrangement is often far from ideal. It was believed necessary, however, because only the foundation was thought capable of supporting the dynamic loading involved when these impact machines were operated. Moreover, their separation from precision equipment by a considerable distance minimized vibration effects on the latter.

Proper shock mounts that prevent communication of the impact to the structure eliminate this obstacle to efficient placement of machinery. Dynamic loading is reduced to a fraction of former values. Building-borne vibration is suppressed. Equipment does not have to be lagged to the floor. It becomes entirely feasible, therefore, to locate a punch press next to a grinder or a gaging operation if that will facilitate materials handling or work flow.

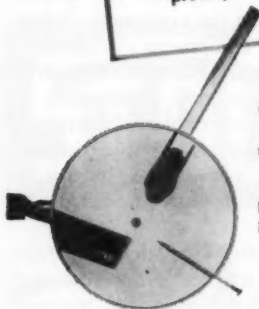
Inherent in this mobility of shock-mounted equipment are other significant advantages. Conversion of production lines for model changes or defense work is speeded immensely. In a test at the Barry Corporation plant, a complete assembly line was dismantled and replaced with a new pro-



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gression of eight heavy machines in exactly twenty-three minutes. That was the elapsed time between shutting down the original line and turning on the power for the equipment that replaced it.

Shock and vibration control also permit savings in the construction of new plant facilities. The reduction in dynamic loading of the structure afforded by shock mounts does away with the need for special concrete foundations under heavy impact-type machines. And, as already noted, lagging of equipment to the floor is eliminated.

Noise Level Reduced

One other benefit of vibration control is worthy of mention; its contribution to holding down the noise level. Common sense and a great deal of research attest the fact that excessive noise is an adverse factor in worker efficiency, morale and safety. It may be inevitable in a metalworking plant, but usually it can be reduced. In every case where equipment has been mounted on vibration isolators, the noise that previously emanated not only from the equipment itself but from ductwork, windows, belt shields and other sources was appreciably diminished.

Selection of the proper mounts is important if their potential benefits are to be fully realized. Within the two broad classes of mounts—one type for shock, another for vibration—there are both general and special purpose mounts in a variety of load ranges and frequencies. Where the problem is clearly defined, no special knowledge of vibration theory is required to select with the manufacturer's help the right mounts for all ordinary equipment. There are cases, however, where spe-

cial engineering service is advisable. The mounts themselves are inexpensive and pose no installation problem.

Vibration has been so clearly established as a causative factor in rejects, lowered product quality and maintenance expense that a searching analysis of operations commends itself to cost-sensitive management. Where such analyses have been made, vibration usually turned out to be a bigger factor than had been expected. And, in terms of the practically ideal condition that can be achieved, it is a costly nuisance even where its effects are not dramatically self-evident.

No less important are the new horizons opened up by mobility of equipment. With effective vibration control, production lines can be set up for optimum work flow and ease of materials handling. They can be quickly rearranged when circumstances dictate. Duplication of equipment can often be avoided because machines can be moved temporarily from one department to another. The entire plant becomes a more flexible, more efficient instrument of production, responsive at once to any new demands that may be made upon it.

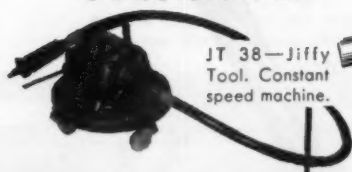
In a competitive economy alert management that utilizes every tool and technique to shave costs and improve quality holds a signal advantage over less efficient producers. Vibration control has demonstrated its effectiveness as such a tool.

The End

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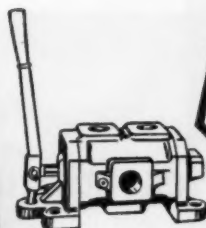
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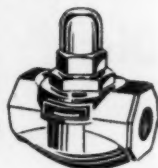
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Ford Solves Critical Compressor Disc Problem

COMPRESSOR discs for the J-57, claimed to be the world's most powerful production jet engine, are extremely critical parts to machine. At one point the stainless steel narrows to a thin one-eighth inch. Using ordinary T-lathes, the discs have a tendency to "dish" if too much tool pressure is applied. Processing time is high because each disc must be turned at least six times during the finish contouring and scrap has been unavoidably out of proportion.

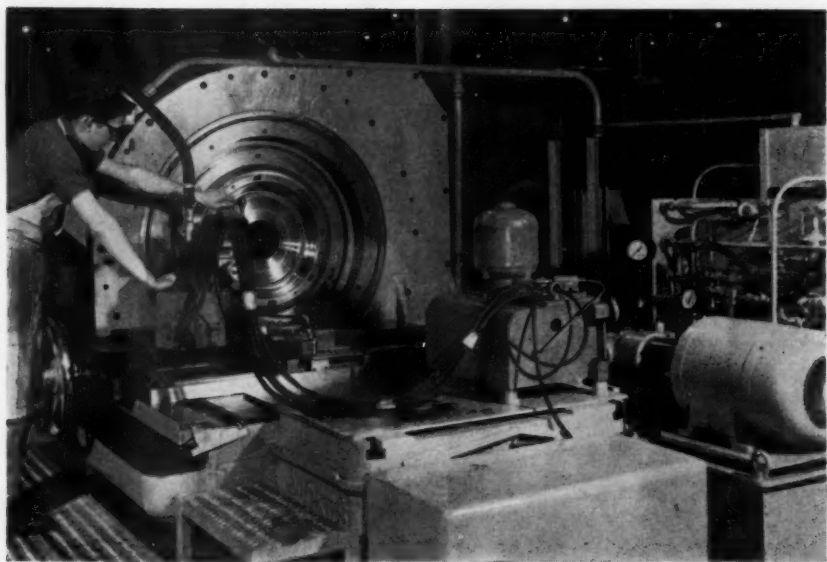
There are 16 compressor discs in each J-57 engine, each holding a specified number of blades. Disc diameters vary depending on the stage and number and length of blades to be contained.

Thompson Products, Pratt & Whitney Aircraft (designer of the J-57) and Ford Aircraft Engine Division all experienced the troubles outlined in attempting to machine compressor discs. Ford turned the problem over to its semi-production department for solution. This department is ready at all times to supply critically needed parts on an immediate basis to keep the J-57 program on schedule.

- Problem: *Design a machine tool capable of simultaneously turning both sides of a J-57 compressor disc.*
- Solution: *Conversion of an obsolete Wickes center drive lathe formerly used in the precision machining of piston engine crankshafts.*
- Time: *2467.1 direct labor man-hours.*

Production equipment designers in semi-production envisioned a machine embodying the principles of two T-lathes head to head, with a center drive feature to permit simultaneous machining both sides of the disc. Obsolete machine tools, still in the division from the completed piston engine program, were examined prior to return to Air Force storage depots. A Wickes Center Drive crankshaft lathe was chosen as one machine having the possibility of conversion. It had cost \$78,000 new.

Tool designers were called in. They made quick layouts, both from a cost and time standpoint. Their estimate



was one year. Semi-production, however, wanted the machine in a matter of months and decided to tackle the job alone.

It was late June when production equipment designer Larry Lund started the full design layout. That completed, the lathe was stripped to its base, retaining only the center drive feature. New ways and carriages were installed, a hydraulic tracing unit was incorporated and different feed mechanisms with proper ratios were built in. Spindles, speeds, tooling provisions and coolants were revised and adapted.

Early in December the machine was ready for its first run, a matter of slightly more than five months from the time design layout was begun. The original estimate had been 2,000 hours of direct labor and the final figure was 2,467.1—which in projects of this type

is considered to be very close.

As the contour finishing machine now looks it bears little, if any, resemblance to the original crankshaft lathe. Tools work opposite each other at all times, eliminating the "dish" and other distortion problems formerly encountered in single face contouring. Setup time has been decreased 75 percent, output has doubled, quality has improved tremendously and scrap losses are negligible.

In the present operation, other machines turn the proper outside diameter on the rough disc forging, and face two flanges. The new tool does rough contour turning. The disc is removed and again goes to other machines for finish boring and flange finishing. Finish contouring is done on the adapted center drive lathe.

The End.

Welding Heavy Bull Gears

by **Charles N. Aronson,**

President and Chief Engineer
Aronson Machine Company
Arcade, New York

BY THE USE of semi-automatic welding equipment and a specially designed rig for its easy manipulation, we are producing huge bull gears almost 3 feet in diameter (figure 1) made up of eight separate components and requiring nine circumferential welds of varying diameters.

The bull gears are used on positioners, a major product of our company. They are made of precise weldment blanks weighing 525 lb. each, which requires the loss of only 10 lbs. in machining.

As our company is not a large one, its methods are adapted to production runs of 5 to 10 units at a time. But we feel that we are able to compete successfully with larger manufacturers by careful design and efficient production methods. Total labor involves less than 12 man hours, including both welding and machine shop time.

All components are fully circular in shape except two rings which are made

Hidden arc process, good fit-ups and tack welding, specially designed rig contribute to success of gear weldment.

in semicircles from strip stock that is rolled. These semicircular components are joined by hand arc welding. All the other welds, save tack welds and one deeply recessed weld that can be reached only by hand equipment, are made with a Lincolnweld manual hidden arc unit. Throughout the production of the gear weldment, it is supported on and rotated by one of our own positioners.

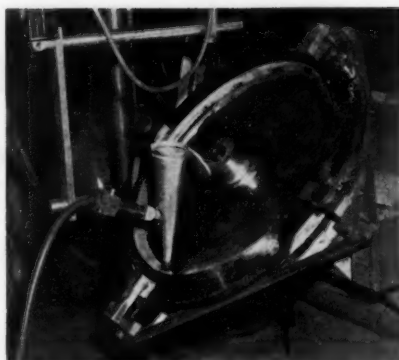
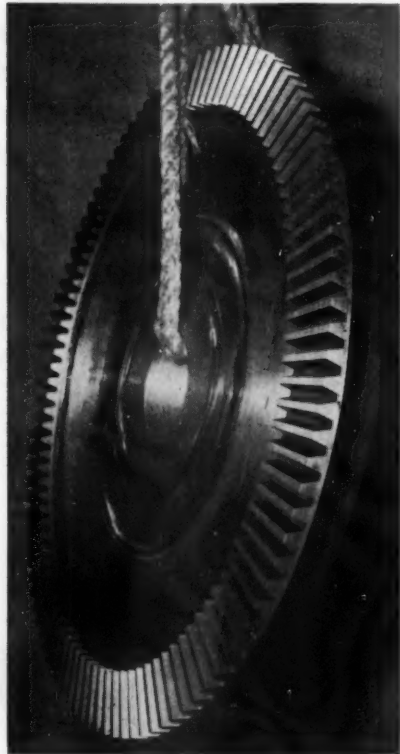
Figure 2 shows the start of the build-up of the gear. Here a $\frac{1}{2}$ " disc is being joined to a flame-cut ring of $34\frac{1}{4}$ " o.d. These components are first clamped to the positioner table, then tack welded. The semiautomatic "squirt" gun is then brought into position, and by means of a foot switch, the rotation

of the table is started. The welding speed is 12 inches per minute, attained in this setup with a table speed of 0.137 rpm.

Throughout the work, the hidden arc wire is 5/32" L-60; flux is No. 840; amperage, 500.

Figure 3 shows the second step. Here the work has been turned over and the disc and ring are further welded, this time on the circumference. The operator uses a brush with his left hand to hold the flux in position. In order to maintain the same 12 inches per minute

1. Finished precision bull gear, almost 3 feet in diameter.



2. Making the initial weld in producing a bull gear blank. Here a 1/2" disc is being joined to a flame-cut ring.

welding speed, the table speed is cut to 0.087 rpm.

Next step is to weld the tubular hub, seen here clamped in position, to the plate. For this, the gun is simply moved to the required spot and the table speed changed to 0.637 rpm.

A 27" disc is now added to the other face of the hub, as shown in figure 4. The slot between the two discs is so deep that the weld inside must be made by hand. A 1/4" LH-70 rod is used at 375 amperes.

After the second disc is further welded to the hub—this time at the outside surface—a support ring is added between the two discs, as shown in figure 5. Since the diameter of this ring is less than that of the discs, it has to be made in two halves.

The ring halves are 1/2"x2 1/4" and made of cold rolled stock because of the closer rolling tolerances that can be maintained with this type of steel. To insert the ring halves, the two discs have to be spread apart slightly with small screw jacks, as seen in the photograph. When the halves are in place,



3. Here the disc and ring have been turned over and are being welded on the circumference. The operator uses a brush to hold the flux in position.

they are tacked and then are ready for welding.

They are welded, of course, to both discs. One of these welds is quite easily reached with the squirt gun, but not so with the other. This latter weld

is shown in figure 6, the positioner being tilted to a reverse angle. Nevertheless, excellent welds result. From this view, it is apparent that the squirt gun can get into spaces where a more bulky head could not reach—also how readily the positioner holds the work in the best position for welding. For joining the ring halves, table rotation is set at 0.156 rpm.

The final reinforcement is now added. This is a ring of hot rolled steel around the outside which closes the slot between the two discs. This ring is $\frac{1}{2}$ "x3", and made in two halves but put in place without its ends being welded together. This enables the operator to tack weld the part and hold required dimensional tolerances within the close limits set.

These ring halves are welded to both discs. Again, a brush is used to hold the flux in position. Table speeds on these last two welds are 0.134 and 0.139 rpm. These slight differences may appear unimportant but they hold the welding speed to precisely 12 inches per minute—which is the speed found best for all hidden arc welding on this piece. With the Graham transmission,

4. When a second disc is added to the hub, the recess is so deep it can be reached only with a hand electrode. This shows the weld being made with a $\frac{1}{4}$ " rod.

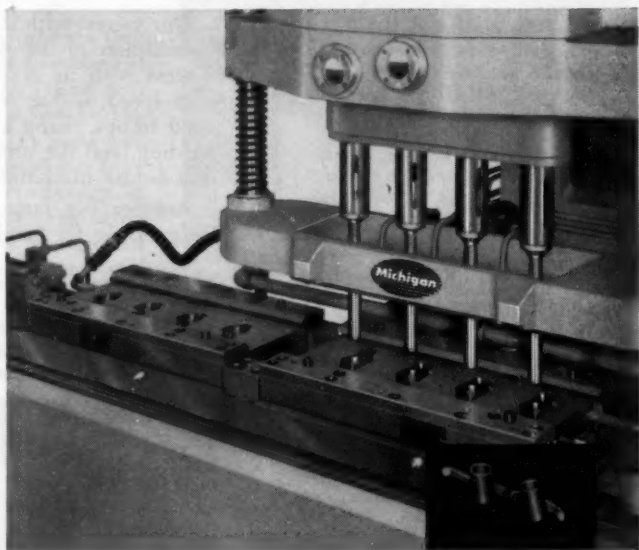


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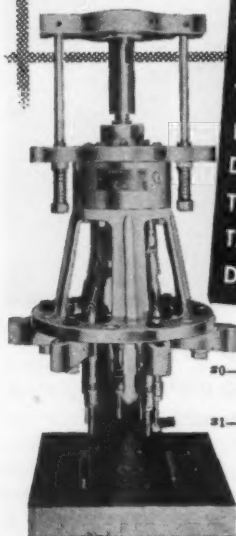
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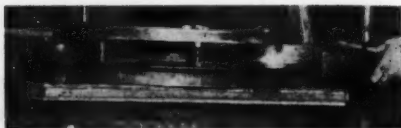
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5. To insert the inner spacing ring, it has to be made in two halves, and small screw jacks are used to spread the mating plates.

which controls the rotary speed of the table on Aronson positioners, the operator, even when wearing stiff gloves, can set the rotary speed within 0.0015 rpm.

Our success with this gear weldment, in addition to use of the hidden arc process with its deep penetration and high speed, is due, we feel, to making good fit-ups, doing a good job of tack welding, and the stress relief given the unit before machining.

Another big factor is the specially designed rig for handling and controll-

6. Making one of the circular welds that attaches the two half rings to the weldment. With the work tilted as shown, the squirt cone is slender enough to enter the groove and an excellent weld results.



Encircle No. 284 on Card, Opposite Page 65



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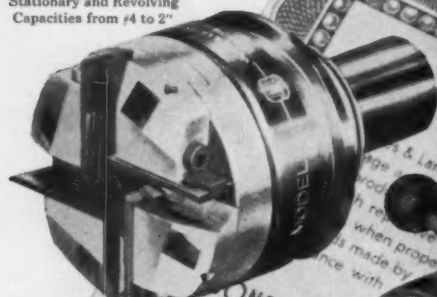
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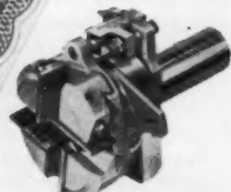
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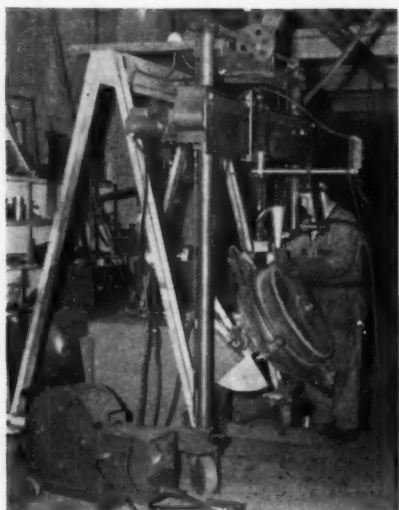


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THREAD TOOL DIV.

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7. Specially made rig for use with the semiautomatic hidden arc welder. With this rig, the squirt gun can easily be fixed in any desired position for circular welding, or the gun can be moved horizontally for straight-line welding. The rig is built on casters.

ing the squirt gun, shown in figure 7. This device, used for a number of other hidden arc operations in addition to the gear welding, is an invaluable piece of equipment in our shop.

With this rig, we can easily and quickly fix the squirt gun in any desired position for circumferential welding such as on bull gears, for example, or we can mechanically move the gun horizontally for straight-line welds, thus making the hidden arc unit, in effect, a completely automatic welder.

The rig is built on a pair of "A" frames tied together by a welded structure and is equipped with casters to make it easily movable.

A clamp grips the welder hose close to the flux cone and this holds the gun vertical or at any feasible angle.

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The clamp is supported in turn on a wheeled carriage arranged for a horizontal traverse of 60 inches along a beam. Motion of this carriage is controlled by an infinitely variable transmission that provides any welding speed from zero to 50 inches per minute. To make the beam adjustable for height, it is supported on sleeves and moved up and down on vertical

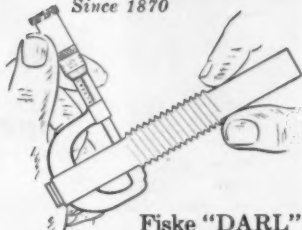
tubes at each end of the beam by motor-driven chains.

For making circumferential welds, the rig is simply moved over a positioner, the beam carriage is locked—thus holding the squirt cone in a fixed spot—and the work is rotated at the desired speed on the positioner, as previously described.

The End



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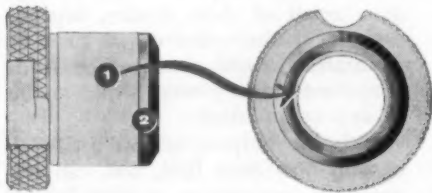
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Simplified Drafting Boosts Drawing Room Productivity

by J. G. S. Billingsley

Professional Engineer,

Associate Professor of Mechanical Engineering,

Norwich University

Northfield, Vt.

HAD you walked into a drafting office some 30 or 40 years ago and noted the mechanical drawing operation, what you would have seen would not have differed materially from the drafting operation as it is carried out to-day. Since the methods have remained practically the same, it would not be surprising to find that the time taken to complete a drawing in 1915 did not vary much from the time taken to complete a similar job in 1955. This state of affairs is in rather sharp contrast to the marked gains in productivity made by almost all other divisions of the modern industrial group during the same period of time.

A few years ago, many large companies viewed their ever increasing drafting room costs with alarm and decided it was time that an effort should be made to find out the "why" of the high costs and the "how" of reducing same. The resulting investigations pointed out the need for a simplified drafting technique which would specify a purely functional drawing

- *drafting room savings up to 40%*
- *improve competitive position*
- *no increase in manufacturing costs*
- *reduces direct drafting costs*

completely stripped of all artistry. The simplified techniques, which evolved as a result of these studies, brought savings of the order of 20 to 40% in drafting room costs to the firms concerned—a very worthwhile saving in any organization.

It is the purpose of this article to explain how your firm, too, can improve its competitive position by reducing drafting costs through the use of simplified drawing practises.

In the company with which the author was previously associated this simplified procedure was first introduced into the tool design section. The company was faced with a heavy tooling program and, in view of the time element involved, it appeared that a sizeable increase in staff would be

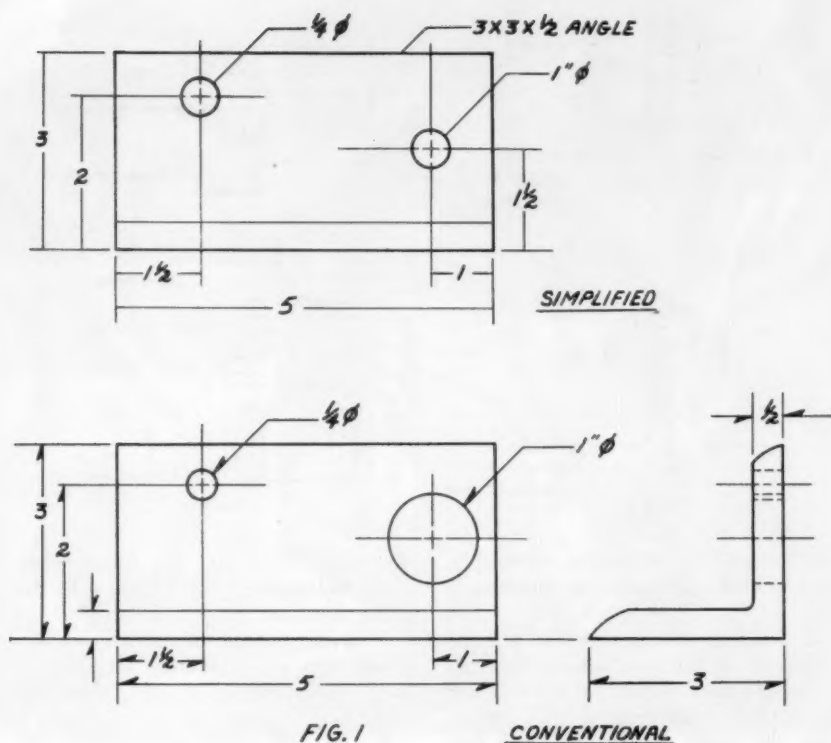


FIG. 1

CONVENTIONAL

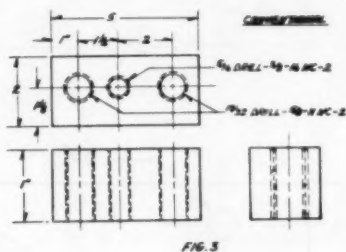
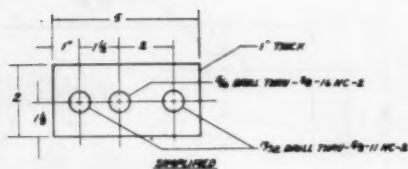
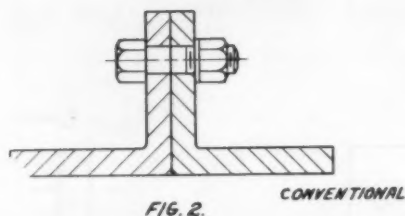
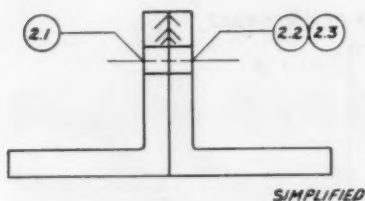
necessary to satisfactorily meet the program. The introduction of simplified drawing increased the departments productivity to an extent where a 30% time saving was evident and the necessity for a large staff increase was thereby removed.

Naturally the question will immediately be raised as to what effect the simplified drawings will have on manufacturing costs. Our experience of no increase in manufacturing cost was completely in line with that of all other firms with whom this phase of the operation had been discussed. During the earlier days of the introduction of the method it is natural to ex-

pect that a good many questions will be raised by the shops. These difficulties, however, will rapidly disappear as the shop personnel and the draftsmen become thoroughly familiar with the system. It is not unusual to expect a drop in shop costs after the familiarization period because the simplified drawings, being less cluttered up, are easier to read than the conventional ones.

The basic steps to simplified drafting are enumerated below:

1. Eliminate arrow heads entirely. The extension lines will clearly show



the limits of the dimension referred to. Arrow heads are excess on leaders too. (fig. 1)

2. Keep projected views to a minimum. If in the past, convention has called for three views, but actually one view with a short note will suffice, take the latter course and save half the time. (fig. 3)

3. Use cross hatching in sectional views only when it is absolutely essential to the understanding of the drawing and then use as sparingly as possible. (fig. 2)

4. Use small free hand circles to indicate holes and show the required hole size by a leader and a note. (fig. 1)

5. Use slant capitals and lower case lettering throughout as this has been proven to be the fastest method of lettering. Do not use lettering guide lines.

6. Make all views as simple as possible, showing only those details which are essential to the manufacture of

the part. As an example, unmachined cored holes are of little interest to the shop, therefore, leave out entirely.

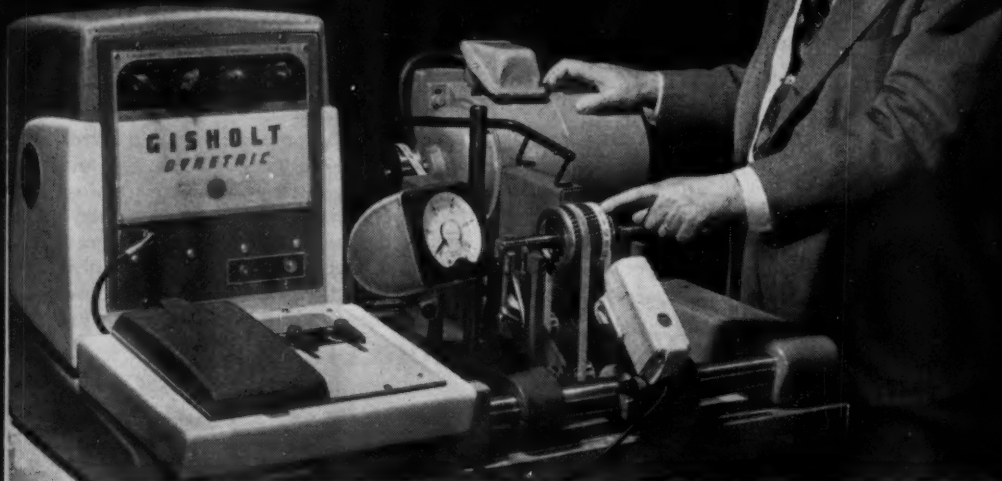
7. Avoid the use of hidden outlines unless they are absolutely necessary to the understanding of the drawing. (fig. 6)

8. Use free hand orthographic, or pictorial sketches wherever practical. A good pictorial sketch will tell a very complete story. These are particularly valuable for reducing drafting costs in the plant engineering and tooling divisions. Don't be afraid to introduce some free hand work in combination with instrument drawing. This acceptable combination will prove to be a real time saver. (fig. 5)

9. Make use of rubber stamps or similar for title blocks, material lists and any other information which regularly appears on your drawings.

10. Eliminate all decorative configurations such as shading, etc.

11. Use recognized and accepted



Why GISHOLT BALANCING stresses "plane separation"

Take this typical part: when you rotate it at high speed, any unbalance effect at one point—or plane—has a "cross effect" in another. If you don't have proper means for separating these unbalance effects in two correction planes, then your balancing job becomes a tedious, time-wasting job of trial and error. And you're never quite sure.

Gisholt Balancers provide plane separation by means of electrical networks. They enable you to use whatever correction planes are most convenient on your specific parts. They are capable of measuring vibratory movement of at least .000025 inch. Gisholts are faster, easier to operate, easier to read.

And they make it easy for you to be *sure*.

To have less than these advantages is to add to your costs in time, loss of accuracy and inferior balancing standards. Ask us to send the Gisholt Balancing Catalog.

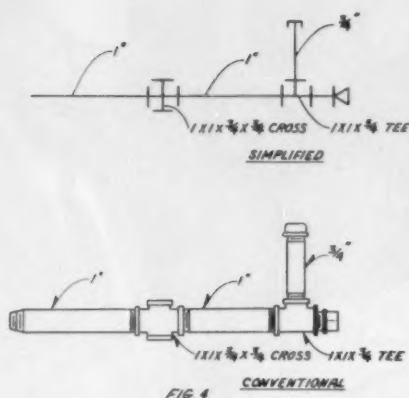
GISHOLT

MACHINE COMPANY

Madison 10, Wisconsin



TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

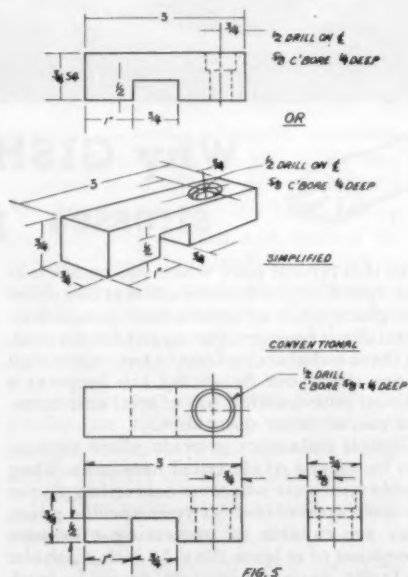


symbols and simplifications such as those associated with gears, piping, electrical components, etc. (fig. 4)

12. Leave off detailed outlines of bolts, nuts and other hardware. Indicate these items by running a leader from the part to the hole. (fig. 2)

The above steps to simplified drawing are to be considered the basic ones only and it is strongly recommended that the simplified drawing technique be incorporated to at least this extent. It might be well to remind the reader that drawing simplification can be developed to a much greater extent than is presented here but complete familiarization with the above steps is essential before proceeding further. No attempt will be made to deal with the more advanced phases at this time as it is felt that there are excellent texts on the subject available to those wishing to study the method further. Once a firm has experienced the savings that adoption of the above basic steps can bring there will be no lack of initiative to investigate the advanced phases of the subject.

The method of introducing this system might next be given consideration. Two possibilities are presented. The first deals with the immediate introduction of all rules at one time and the second with the introduction of a rule at a time. It is felt that the method of introduction is relatively unimportant, though the first method is certainly favored. Of far more importance than the method of introduction is the follow up program which should be strongly in evidence during the first year. The importance of this follow up cannot be overemphasized as there is a natural tendency on the part of draftsmen to resist any change in procedure which tends to take the artistry out of drafting and reduce the operation to one of conveying on paper only that information essential to the complete understanding of the project in hand.





**one must set the example
...and with high speed steel
it's REX**

It's a real satisfaction when you set the example by what you make . . . when it becomes a *standard for comparison*. That's why Crucible is proud to have kept REX high speed steel tops in its class for so many years.

But don't take our word for REX's superiority. Try it on your own work. Compare its structure, finish, hardenability, carbide distribution and general uniformity. You'll see for yourself why it's the *standard* wherever high speed steels are used.

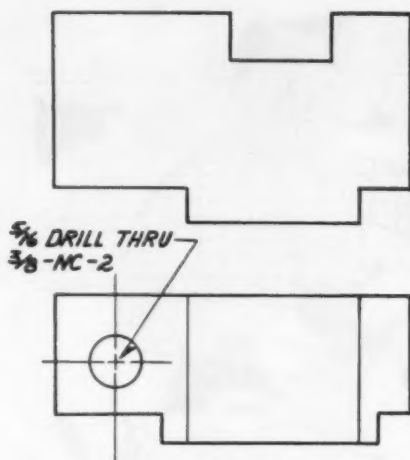
Remember, REX is made only by Crucible. So call for REX at your nearby Crucible warehouse, or for quick mill delivery—Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.

CRUCIBLE

first name in special purpose steels

Crucible Steel Company of America

Encircle No. 289 on Card, Opposite Page 65



SIMPLIFIED

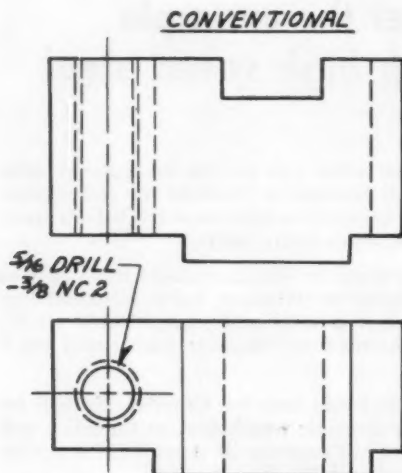


FIG. 6

The final phase of discussion will be centered about the method used to record progress in order that savings

made can be fairly accurately evaluated. Possibly the easiest and most satisfactory method is to record the number of square feet of drawings produced per draftsman per unit time. This may at first glance seem to be a rather unreliable criterion because of the variation of complexity between various drawings. If the time per square foot is averaged out on a bi-weekly or monthly basis the effect of varying complexity is practically nullified, with the result that the records advocated will give a reasonably accurate measure of the progress being made. The square footage of a drawing is construed as being the square footage available for a drawing on any standard sized drawing sheet used, it being assumed that only the necessary sized sheet is used for each drawing.

The changes advocated may at first appear to be so simple that one may wonder if the benefits claimed can possibly result from their adoption. The answer to this will be very evident after the system has been in operation for a month or so. The evidence available then should be sufficiently convincing to impress on the investigator that a method need not be complicated to be efficient and time saving. For those who will take the time to develop a well thought out program to introduce this system, there will be a very worthwhile reward in the form of greatly reduced drafting costs—a prize worth seeking in these very competitive times.

The End.

Come to Chicago Sept. 6-17 for three great events: National Machine Tool Show; Production Engineering Show; Coliseum Machinery Show.

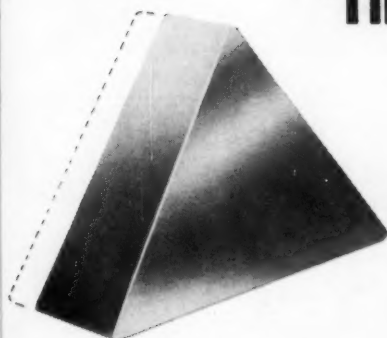
NOW!

for the first time ...
new, lower cost

ADAMAS

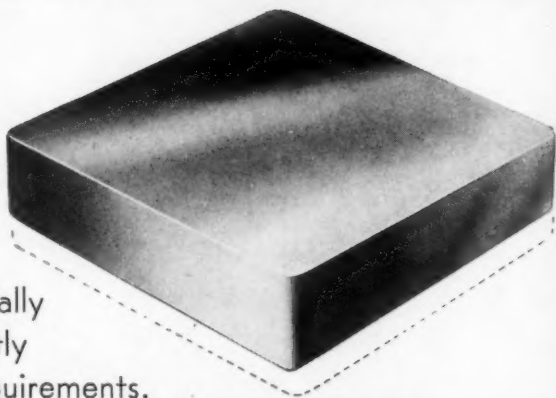
'Throw-Away' blanks

— each size in two thicknesses



No matter what your choice
of popular 'Throw-Away'
blank tool holders ...

you'll find an Adamas
'Throw-Away' blank specifically
engineered to fit perfectly
with your tooling requirements.



Adamas 'Throw-Away' blanks are available in utility grind
(top and bottom ground only) and in
precision grind (ground on all surfaces for precision indexing).

For more pieces between indexing — lower
production costs — order Adamas 'Throw-Away' blanks
in either standard or premium carbide grades.

Call your local Adamas representative or write
Department 17C, ADAMAS CARBIDE CORPORATION
Kenilworth, New Jersey for price lists.

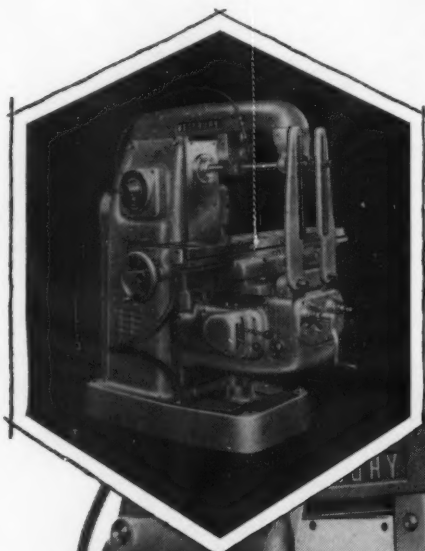


3 NEW WESTBURY

Sizes: 1-U, 2-U, 3-U

HORIZONTAL DIAL-TYPE MILLS

..For Greater Power, Speed and Precision Control



The new Westbury line of horizontal universal milling machines are high-quality, high-precision machines available at a surprisingly low cost. Check these features:

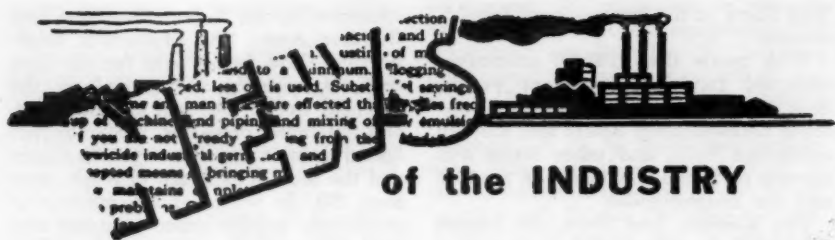
Heat-treated, hardened spindle and all moving parts designed to withstand overloads in excess of 100% • Spindle mounted on adjustable tapered roller bearings • 12 speeds—28 to 1100 rpm or 35 to 1600 rpm • dial and hand control for selecting and reversing • Splash lubricated spindle gear box—extra gear pump for added safety • Power feed and rapid traverse in all directions • Climb milling • Special safety devices prevent operating errors • All ways handscraped • Single lever engages rapid traverse to all movements.

FULLY GUARANTEED



WRITE, WIRE OR PHONE FOR DETAILED DESCRIPTIVE LITERATURE

Encircle No. 28 on Card, Opposite Page 65



Helicopter to Shuttle Visitors Between Two Chicago Shows

A scheduled helicopter passenger service will carry businessmen between the Production Engineering Show at Chicago's Navy Pier and The Machine

Machine Tool Show Committee at the National Machine Tool Builders' Association spring meeting at Chicago, May 5-6. Back row: James C. Hebert, Jones & Lamson Machine Co.; Donald H. McIver, Ex-Cell-O Corp.; Frank Moran, Carlton Machine Tool Co.; Stanley A. Brandenburg, Monarch Machine Tool Co.; Burnell A. Gustafson, Sundstrand Machine Tool Co. Front row: W. E. Rutz, Giddings & Lewis Machine Tool Co.; M. A. Hollengreen, Landis Tool Co.; Frank U. Hayes, Bullard Co. Missing: E. P. Cunningham, Clearing Machine Co.; Tell Berna, Gen. Mar., N.M.T.B.A.



Tool Show at the International Amphitheatre.

With more than 100,000 executives expected for the concurrent events, Sept. 6-16, fleets of buses also will operate between Loop hotels and the two exhibition halls, and other buses will operate on round trips between the Pier and the Amphitheatre.

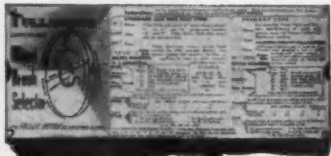
The Machine Tool Show, the largest industrial exposition in the country, is

sponsored by the National Machine Tool Builders Assn. The Production Engineering Show being held for the first time, is bursting full grown on the business world. Devoted to automation and automatic processes, it already has leased exhibit space to 175 companies and the total is expected to reach more than 250. In terms of the number of exhibitors, display space occupied and total audience, the show is expected to

a FULLER BRUSH product

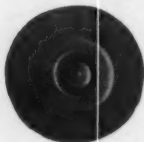
New Time-Saver for Engineers

***YOURS
FREE***



Handy Fuller Slide Chart of Wheel Brush Specifications

Wheel brush selection with a flip of the wrist. No catalog searching . . . no comeback from "Purchasing" . . . You can even give them the stock numbers of:



**FULLANCHOR
Super-Balance
WHEEL BRUSHES**

Yours for the asking, without cost or obligation, simply by writing to . . .

**THE FULLER BRUSH COMPANY
3624 Main Street, Hartford 15, Conn.**

a FULLER BRUSH product

exceed any new industrial exposition ever staged.

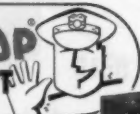
Hours of both shows have been coordinated to permit visitors to make maximum use of their time. The Machine Tool Show will be open from 10 a.m. to 5:30 p.m. while the Production Engineering Show will operate from 1 to 10 p.m.

Equipment to be shown at the Production Engineering Show falls into eight major categories: (1) monitoring

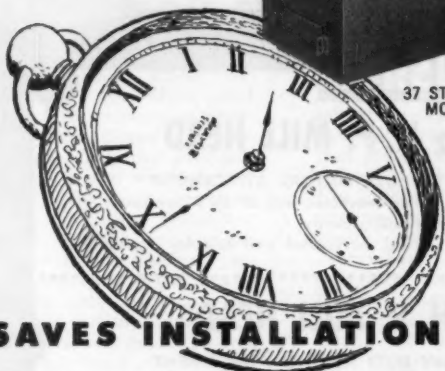
equipment; (2) governing equipment; (3) special production equipment; (4) equipment components; (5) handling equipment; (6) communications equipment; (7) inspection and gaging equipment; (8) machine tool accessories.

Scheduled to be held concurrently with these two shows (Sept. 6-17) is the Coliseum Machinery Show whose location will be the Chicago Coliseum. A total of 91 booths will be set up at this show.

DUSTKOP[®]
STOPS DUST



**DUST
COLLECTORS**



37 STANDARD
MODELS

SAVES INSTALLATION TIME

Stop dust quickly, at lower cost, with Dustkop. Thirty-seven standard models *ready to use* and available from stock. Dustkop conserves floor space, reduces maintenance. Collects almost all types of industrial dusts. Write for descriptive literature.

Also a complete line of Mist Collectors

AGET MANUFACTURING COMPANY
1402 East Church St. • Adrian, Michigan

in MILL HEADS

RUSNOK

**Builds the BEST Quality
at the BEST Price**

1/4 H.P. CONVERTIBLE MILL HEAD

Only low cost mill head with quill travel attachment.
High speed medium-light operation.
For bench, floor and pedestal mills.
Fits milling machines with overarm 1 1/2" to 3".
3/8" end mill capacity.

\$245.00



RUSNOK

1/2 H. P. MILL HEAD

HEAVY DUTY MILLING ATTACHMENT
Fits milling machines with 3" to 5" overarm.
3/4" end mill capacity.
For vertical, horizontal and angular operations.

1 H. P. MILL HEAD

HEAVY DUTY MILLING ATTACHMENT
Fits milling machines with 3" to 5" overarm.
3/4" end mill capacity.
For vertical, horizontal and angular operations.

RUSNOK

RUSNOK TOOL WORKS

4840 West North Ave., Chicago 39, Ill.

DEALERS IN ALL PRINCIPAL CITIES

MILLING • DRILLING • BORING

Encircle No. 292 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



JEWEL
BRAND
GEMS



how SPALDING slashed par for golf club finishing costs!

Smoothing and polishing finely balanced stainless steel golf clubs used to be a costly, time-consuming operation — until Jewel Brand Abrasive Engineers helped solve the problem once and for all at the world-famed A. G. Spalding & Bros. Inc., sporting goods plant in Chicopee, Massachusetts. After a careful, on-the-job analysis of the exact finishing requirements, experienced Jewel Brand Engineers were able to select an abrasive belt that not only smoothed and polished precision-made putters and irons faster and easier but brought savings of up to 75%.

This is just one of many examples

of the special knack Jewel Brand Abrasive Engineers have for solving out-of-the-ordinary finishing problems. Combine this ability with the fact that Jewel Brand Abrasive Belts have earned an industry-wide reputation for longer wear plus faster, cleaner cutting action and you have the reason why cost-wise manufacturers everywhere turn to Jewel Brand *first* for finer finishing. Why not prove the advantages of this combination for yourself. Call your nearby Jewel Brand Abrasive Engineer or Industrial Distributor today or write us direct. Abrasive Products, Inc., 527 Pearl Street, South Braintree 85, Mass.



saw any metal
fast and efficiently
with **VICTOR**
Hand or Power
Hack Saw Blades
or
Band Saw Blades



**LET YOUR
VICTOR DISTRIBUTOR
HELP YOU PICK THE RIGHT ONE**

VICTOR

Because he's backed up and trained by experienced factory representatives, your VICTOR Distributor is ideally qualified to help you with your metal cutting operations.

Because he carries complete stocks, he can make quick delivery of whatever you need whenever and wherever you want it.

With his guidance, you can pick the *right* VICTOR Blade for the job you have to do...

VICTOR "MOLY"® High Speed Steel—tops for economy and performance.
VICTOR "MOLYFLEX"®—Cuts like a genuine "Moly" but is so flexible it cannot be broken in use.

VICTOR High Speed Steel—The power blade that's unexcelled for durability and fast cutting.

VICTOR Unbreakable High Speed Steel—Absolutely shatter-proof, fast cutting, flexible, long lasting.

*Sold Only
Through
Recognized
Distributors*

1022



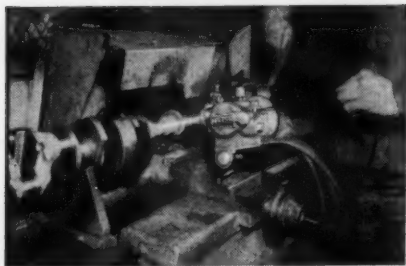
SAW WORKS, INC. • MIDDLETOWN, N. Y., U. S. A.

Makers of Hand and Power Hack Saw Blades, Frames and Metal and Wood Cutting Band Saw Blades.

Encircle No. 294 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

when mistakes happen...



Automotive crankshaft being brought up to inspection standards with metallizing. This automotive manufacturer formerly used plating for this type of salvage, worked one per hour. With metallizing, the salvage operation requires only 5 to 10 minutes per shaft, including surface preparation.

...and they do in any busy machine shop, there's no need to scrap a mis-machined or otherwise damaged machine part that represents an investment of many expensive man-hours.

Parts like these are brought up to inspection standards quickly, easily and inexpensively with metallizing.

And with the new molybdenum metallizing wire, Sprabond, the only surface preparation required is cleaning. The molybdenum forms a molecular bond with the surface being rebuilt. Little heat is generated, eliminating any danger of warpage.

What's more—users have found that the extreme hardness of the molybdenum coating, and its microscopic porosity which provides superior lubricating characteristics, improve its "wear-ability" over ordinary bearing surfaces as much as 25 times. You haven't just salvaged a part—you've improved it.



Free Bulletin

Get the full story on metallizing in production salvage. Bulletin 57-C describes and illustrates the procedures, provides data on typical parts, with interesting photo-micrographs showing the unique bonding action of Sprabond Wire. Send for a copy.

The trade name, SPRABOND WIRE, is the property of Metallizing Engineering Co., Inc.

DON A. WATSON
METALLIZING ENGINEERING CO., INC.
1147 Prospect Ave., Westbury, Long Island, N. Y.

- ☐ Please send me Bulletin 57-C.
☐ Please have Metco Field Engineer call.

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Metallizing Engineering Co., Inc.

1147 Prospect Ave., Westbury, L. I., New York • cable: METCO

In Great Britain:
METALLIZING EQUIPMENT COMPANY, LTD.—Chesham near Woking, England

Encircle No. 295 on Card, Opposite Page 65

Paper Weight Stenciled in One Chucking Operation

By **D. A. Rogers**, President

Dayton Rogers Manufacturing Company
Minneapolis, Minnesota

The paper weight shown was stenciled with the wording "University of Minnesota, College of Engineering" in one single chucking operation.

The paper weight was made from 1" SAE 1010 stock. Work cycle was as follows:

1. Rough blank advanced to stop (1).
2. Forming tool advanced, cutting off previously machined part. The combination cutoff and forming tool advance

completes the cutoff operation and finish forms the next part.

3. The combination knurling and stenciling tool was advanced, knurling and stenciling the paper weight as shown.

4. It should be remembered that the cross knurl of the knurling tool should be the same diameter as the paper weight (A). This sets up means for driving the stencil, compensating for

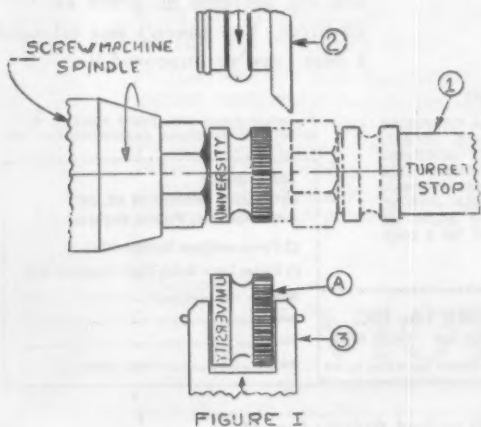
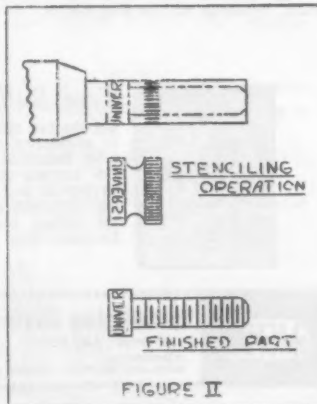


FIGURE I



when the stencil letters are not engaged in the piece part blank, thus eliminating over-riding or blurring of the lettering or wording upon the piece part. It is advisable that the stenciling section of the stenciling tool be from .005 to .010 smaller than the cross knurling section of the knurling tool (A).

This made a very satisfactory setup and quite inexpensive. The same principle can be introduced in stenciling various screw machine products such as shown at Figure 2. The cross-knurling can be removed in the final operation of the finishing of the screw machine parts.

The End

The advertisement features a central graphic with a dark background. At the top, the text "CAPEWELL MAKES EVERY TOOTH COUNT" is written in a bold, sans-serif font. Below this, a stylized saw blade with a jagged edge is depicted. The blade has a circular hole in the center, and the year "1881" is inscribed within it. To the right of the blade, the text "YOU CAN'T BEAT" is written in a bold, sans-serif font. Below the blade, the word "CAPEWELL" is written in a large, bold, sans-serif font. Underneath "CAPEWELL", the words "POWER HACK" and "SAW BLADES" are written in a bold, sans-serif font. At the bottom of the graphic, the text "CAPEWELL MAKES EVERY TOOTH COUNT" is repeated in a bold, sans-serif font.

CAPEWELL MAKES EVERY TOOTH COUNT

YOU CAN'T BEAT

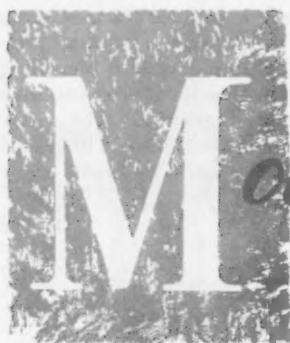
1881 **CAPEWELL**

**POWER HACK
SAW BLADES**

For heavy feeds and fast speeds, for clean, straight cutting, long blade life, specify Capewell Technite all-hard molybdenum high speed steel blades, Capewell High Speed all-hard Tungsten type 18-4-1 high speed steel blades, or Capewell Safetech, the soft-back safety blade with the hardened high speed steel cutting edge. Ask, too, about Capewell Band Saw Blades, Hand Hack Saw Blades and Microloy Ground Flat Tool Steel. The Capewell Manufacturing Co., 82 Governor St., Hartford 2, Conn.

Ask your distributor...

CAPEWELL MAKES EVERY TOOTH COUNT



Modern Tools in Action

First Plant of U.S.A.F. Heavy Press Program Put in Production at Alcoa, Cleveland

Air Force Secretary Harold E. Talbott recently put towering 35,000- and 50,000-ton hydraulic forging presses into production at Aluminum Company of America's Cleveland works.

Formally accepted by Alcoa President I. W. Wilson, the 40-million dollar installation became the first complete plant of the Air Force's 279-million

dollar Heavy Press Program to get into operation.

After Mr. Talbott touched two buttons, the massive presses forged their first products—a wing spar for a jet interceptor and another for a new jet tanker.

Ranking among the world's largest machine tools, the forging presses tower

U. S. Air Force Plant 47 covers over 12 acres of floor space. This view shows truck loading areas on the plant's south side.





The two giant presses shown here will now provide vital production facilities for aircraft structural components at the U.S.A.F. heavy press plant at Alcoa's Cleveland (O.) works. The 35,000 ton capacity press in the foreground rises 42 feet above the floor and extends 34 feet below. The 50,000 ton press in the background stands 50 feet above the floor and 36 feet below.

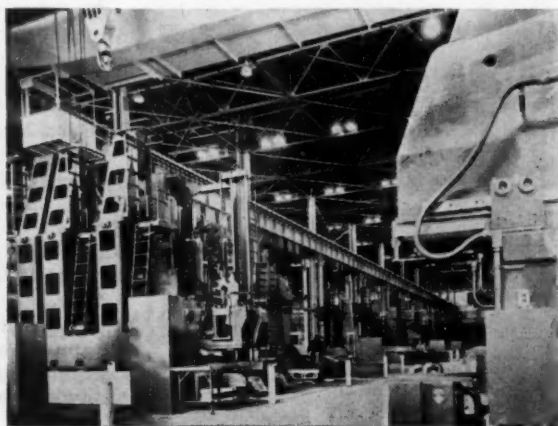
nearly five stories above floor level and extend another three stories below ground. Weighing more than 6000 tons each, the presses dominate all other equipment in the plant, which contains about 12 acres of floor space under roof.

The 35,000 ton press, built by United Engineering and Foundry Co. of Pitts-

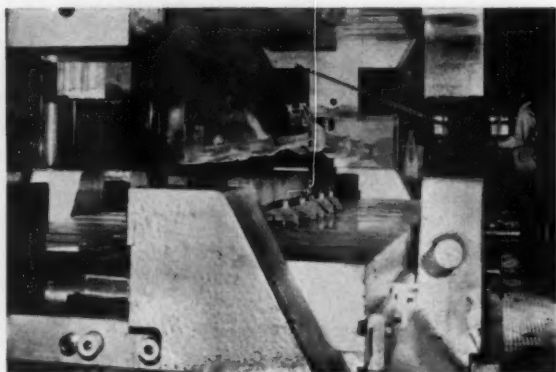
burgh, and the 50,000 ton press, constructed by Mesta Machine Co. of Pittsburgh, are claimed to be capable of making larger and more precise forgings than ever before possible.

Heavy precision forgings mean stronger, lighter and less expensive components for all types of modern military aircraft. Their size will permit

This battery of tracer-controlled die-sinking machines cut the forging cavities in steel die blocks weighing many tons. The die shop is one of the largest in the world.

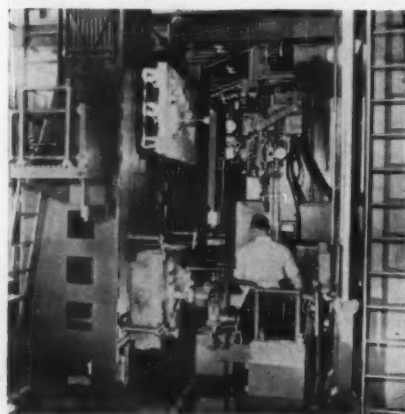


A wing spar forging is being removed from one of the presses immediately after the first blocking or forging squeeze has been performed. The workman holding the long spray pipes is applying lubricant to the forging dies.



one-piece construction of airframe parts which formerly required several pieces. Precision obtainable through the 35,000 and 50,000 tons of forging pressure will reduce previous requirements for expensive machining.

One of the out-size die sinking machines is shown cutting the forging impression into a die for one of the huge presses. A metal finger traces contours of a forging's plaster model (top of machine) and causes matching impression to be sunk automatically into the die block (lower part of photo).



Alcoa hopes to develop civilian products which can be made during periods when military production is not filling press capacity. The company served as the Air Force's prime contractor in building the Cleveland plant. Construction started in May, 1953. Alcoa will operate the plant under a lease, which returns to the Air Force 4% of the company's gross sales from products made on the presses.

Hydro form pressure plates developed by Northrop

Considerable savings are being recorded in Northrop Aircraft's sheet metal fabrication department through development of pressure plates for use with hydro form blocks on a Verson-Wheelon high pressure hydro press.

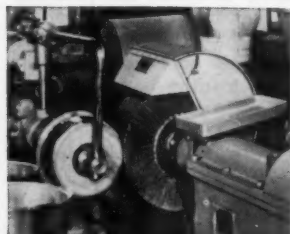
By using the plates, which smooth out wrinkles caused in forming shrink flanges, Northrop finds it is able to eliminate from 50 to 100% of hand form bench time. The average time saved per part is four minutes.

A total of 43 form blocks have been equipped with this type of forming aid. The pressure plates are made in considerably less time than the old shrink bar type forming aids. The tooling time required to make the pressure plates



WANT BETTER PRODUCT QUALITY?

He has an eye for refinements



SAVES 33%. Here, Osborn Power Brushing polishes stainless steel utensils in two steps where it formerly took three. Finishing time is cut 33%. This is typical of results obtained with an OBA.

POWER brushing may be the answer to a higher-quality product for you. To find out, have an Osborn Brushing Specialist take a close look at your cleaning, finishing and burr removal operations. When making an **Osborn Brushing Analysis**, he studies these operations and submits a written report with recommendations for improvements.

In your plant, power brushing might improve product quality—and save thousands of dollars every year, too. Ask for an **OBA**. There is no obligation. Just call or write *The Osborn Manufacturing Company, Dept. L-14, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Osborn Brushes



BRUSHING METHODS • POWER, PAINT AND MAINTENANCE BRUSHES
BRUSHING MACHINES • FOUNDRY MOLDING MACHINES



Additional efficiency has been incorporated into the operations of the Verson-Wheelon Press pictured above in the Northrop Aircraft Inc., sheet metal department, by the development of pressure plates designed to strike out wrinkles in parts formed on the machine.

is one hour each, while the shrink bar type required 18 hours. The latter are

A simple operation using the newly designed pressure plates pictured above (top) removes forming wrinkles from shrink flanges on Northrop Scorpion F-89D parts. The photo shows the flat stamping before being formed in the Verson-Wheelon press, the formed part with a deep wrinkle in the flange, and the smooth finished part after use of the pressure plate in a second run on the huge press.



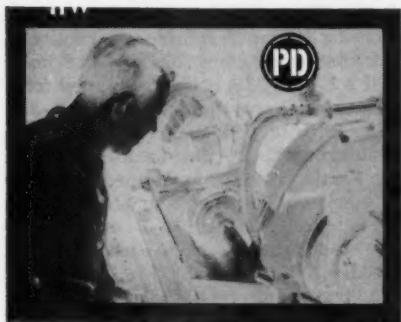
not adaptable to the Verson-Wheelon press.

The Verson-Wheelon press installed at Northrop's Hawthorne factory exerts a pressing force of 19,440 tons, or 38,-880,000 pounds, in its high pressure forming. The press features a double shuttle working table arrangement, with each table measuring three by 12 feet. While one table is inside the pressing section, the other table can be loaded, ready to go into the chamber. This allows continuous operation without loss of time for loading between press operations.

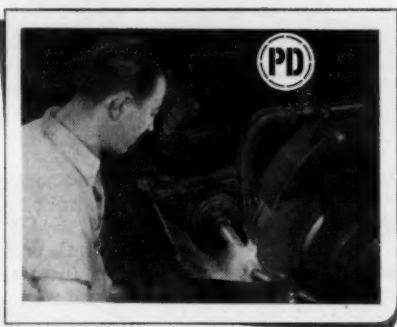
Cylinders perform millions of cycles with no service needed

After millions of cycles and three years of use, T-J Spacemaker cylinders, flexible "Super Cushion" for air and the self-aligning "Master Cushion" for oil, are claimed to have shown practically no wear and have presented no service problem. Cushions result in a complete shutoff of air or oil, and as-

The most important grinding wheel development in years...



JUST AS A NEGATIVE guarantees you an exact duplication of a photograph each and every time, you are always assured a



POSITIVE DUPLICATION of an original grinding wheel each and every time through the CINCINNATI (PD) Manufacturing Process.

NOW!

Cincinnati Grinding Wheels offer



Positive Duplication

Through the CINCINNATI (PD) Manufacturing Process you are assured a Positive Duplication of the original wheel *every* time you reorder. "On grade" with a CINCINNATI (PD) WHEEL means all future (PD) WHEELS will act and grind exactly alike.

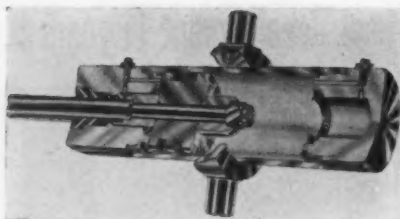
Yet CINCINNATI (PD) WHEELS are priced no higher than ordinary wheels.

We'll be glad to prove to you how CINCINNATI (PD) WHEELS can save you money and increase your production. Just

contact us and we'll send one of our representatives. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.



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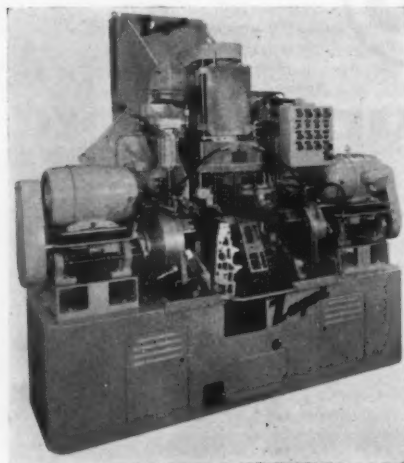
sure smooth cushioning with automatic valve action for fast return stroke, it is said.

Streamlined design eliminates tie rods and reduces head size. Other features include chrome plated bodies and piston rods, solid steel heads and heavy wall seamless steel body, leakproof construction, high safety factor. It is suitable for air pressures to 200 psi, oil pressures to 750 psi.

The manufacturer, Tomkins-Johnson Co., Dept. BB, Jackson, Mich., offers the Spacemaker line on an "off the shelf" basis in a choice of 8640 variations.

Typewriter frames tapped in versatile machine

The Zagar tapping machine accommodates right and left sides, back and



front of the frames for electric typewriters. The machine taps two sides, right and left, or back and front of the frame. Three drill heads on the machine have 23, 21, and 25 spindles, respectively.

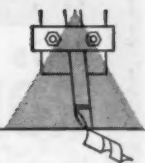
In the side frames, 16 No. 6-40P holes and 2 No. 10-32P holes are tapped from one side. From the top, 2 No. 1/4-20P holes are tapped and 2 1/4" holes are counterbored. In the back section of the frame, 6 holes are tapped from the side and top. On the front piece, a total of 8 holes are tapped, 6 on the top (No. 6-40P) and 2 from each side (No. 10-32P).

A traversing type fixture pulls out of the machine for loading, the parts being loaded in the outside position. Mechanical linkage in the air-clamping mechanism makes operation possible in case of air failure.

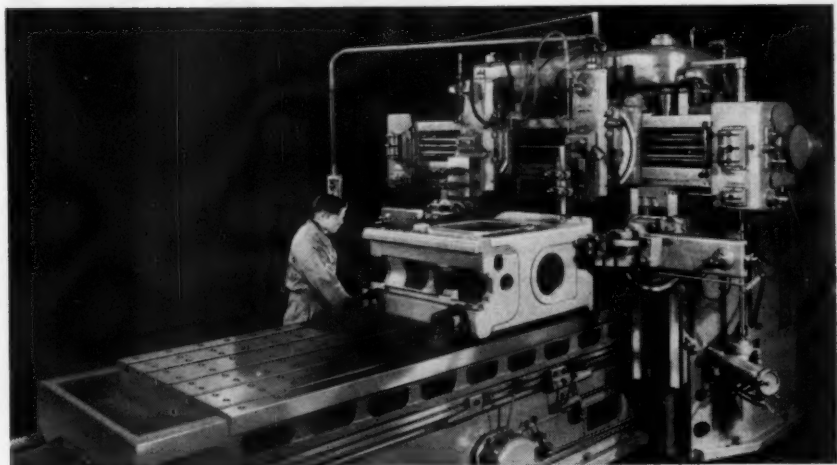
The drill heads are the lead-screw type for precise tapping control. Production is approximately 120 parts per hour. Machine is designed and built by Zagar Tool, Inc., Dept. MTB, 24000 Lakeland Blvd., Cleveland 23, O.



a cost cut . . . with every stroke
of rockford hydraulic-driven



planers



higher production is obtained with every stroke **because...**

the great new Triple Circuit offers the correct combination of cutting speed and force to most economically machine materials from the free-cutting types to the toughest steel.

Send us your Planing specifications.
Ask for full details of the Triple
Circuit planing efficiency.

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52nd
YEAR

ROCKFORD MACHINE TOOL CO.

2500 KISHWAUKEE STREET • ROCKFORD, ILLINOIS

this
RODGERS PLATEN PRESS
 produces
GRIDDLES
 at a sizzling rate!



Ever since they changed from a mechanical press to a Rodgers 100 ton Hydraulic Platen Press, Northland Aluminum Products of Minneapolis has reported they are not only pleased, but also surprised at the unusual results. No wonder! . . . production is up . . . product quality and finish is better . . . die wear is reduced . . . and die setup time is less. All these advantages are vitally important to Northland for they make a variety of products like Nordic Ware Aluminum Utensils, Griddle King Griddles and Steak Platters.

Although you may produce an entirely different line of products you probably would find a Standard Rodgers Platen Press would offer you the same advantages . . . whether your jobs are stamping, forming, drawing, coining, or die try-out . . . in metal or plastics.

*Write for the new Illustrated
 Rodgers Blue Ribbon Catalog*



it gives complete details and specifications

**RODGERS BLUE RIBBON
 PLATEN PRESSES FOR:**

- Metal Drawing and Forming
- Plastic and Rubber Molding
- Die Try-Out General Assembly and Utility Work
- Capacities from 10 to 500 tons pressure



Here is the Rodgers 100 ton Hydraulic 24"x24" Platen Press which blanks and forms Northland Griddle Kings at the rate of 8 per minute. Aluminum is .153—finished size is 10¾" x 17½".



Rodgers Hydraulic Inc.

7453 Walker St., Minneapolis 16, Minn.

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MACHINE and TOOL BLUE BOOK

Shop HINTS



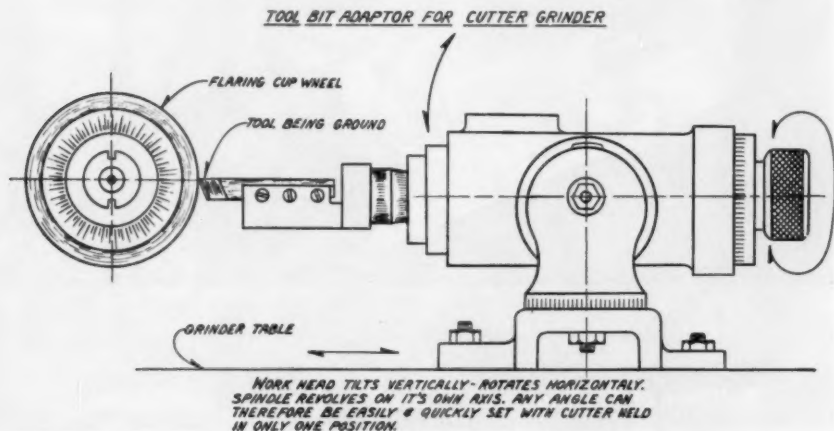
Lathe Tool Adaptor For The Cutter Grinder

By H. J. Gerber

A tool and cutter grinding machine is ordinarily equipped with a small vise to be mounted on the universal angle attachments which support the sensitive work head. It is common practice to use this vise to hold lathe tools, particularly thread chasing tools, for accurately grinding them. This arrangement is, however, awkward and time consuming to use. The illustrated

simple holder is intended to be used directly in the sensitive work head and is very convenient. It will also eliminate the necessity of taking down the workhead and mounting the vise.

The simple holding device has a taper shank made to fit the taper in the spindle of the workhead. It may be tightly secured by the usual draw-in bar. Tool bits are held in place by



Mill circles and angles in



Angular adjustment of cutter in the vertical plane is an exclusive feature of the TRI-D Milling Head. Here, operator finish mills intricate workpiece requiring straight, circular, angular and radii milling . . . all accom-

plished in a single set-up.

This job and many others are featured in a 20-minute sound color film, "The Little Show-off." Write on your company or school stationery for reservation.

Builders of Precision and Production Machine Tools Since 1898

one set-up with

For tool rooms, die shops or production milling—do it faster, easier with new TRI-D Head

Kearney & Trecker's new TRI-D Milling Head—featuring rotary movement, lateral and angular adjustment in vertical plane—measureably cuts production milling costs . . . eliminates multiple set-ups . . . produces more in less time. The TRI-D is ideally suited for rough and finish milling of various geometric shapes—straight lines, radii, circles, angles—all in a single set-up. It's adaptable for easy mounting on almost all horizontal and some vertical milling machines . . . *regardless of make.*

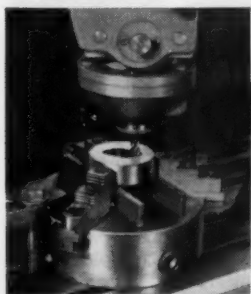
Learn what TRI-D can do for you. Contact your Kearney & Trecker representative for a "proof-positive" demonstration, or write Kearney & Trecker Corp., 6784 W. National Ave., Milwaukee 14, Wis.



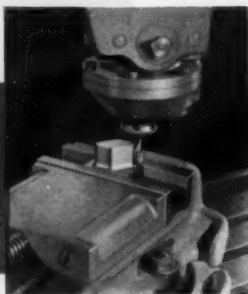
Pat. No. 2286821
Other Pat. Pend.



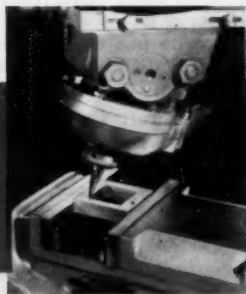
Kearney & Trecker will display and operate more than 25 standard and production machines, including attachments and accessories. Be sure to visit Booth No. 508.



Die (left) and punch are rough and finish milled in single set-up, using three basic movements of TRI-D and milling machine. Table is swiveled for milling straight side of workpieces. Table feed used to mill



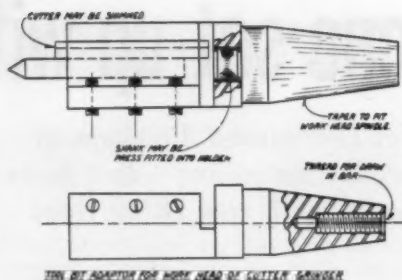
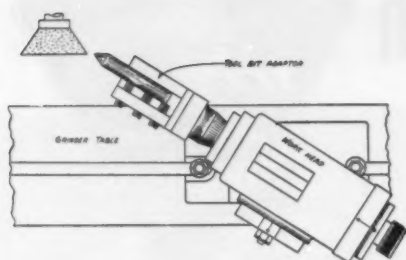
long straight side. TRI-D is rotated. Saddle feed is engaged to mill short side. At tangent of next radii, saddle feed disengaged and procedure repeated. Clearance angle in die is milled using same dimensions.



TRI-D with end-mill ground to specific angle is used to square corners. Adjustment of TRI-D and swivel block to prescribed setting and vertical feed of machine is all that's required to do the job.



For more information on TRI-D Milling Head, write for catalog No. TD-10.



simple lock screws, as illustrated. Use is made of the graduated rotary motion of the workhead spindle on its own axis for setting side relief angles on the cutting tools.

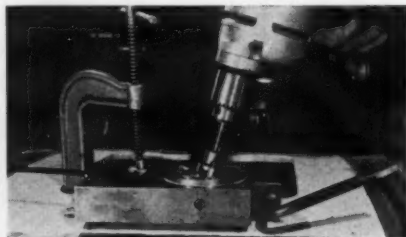
If desired, the shank and holder body

can be made as separate pieces and press fitted together, as illustrated. If the work head is mounted on its universal angle bracket all grinding operations can be completed in only one setup of the tool.

Block for Contoured, Angled Drilling

Drill bits like to wander when used at an angle or on a contoured surface. Inaccurate holes often result, and quality depends solely on experience of the driller, who has no mechanical aids to steady the drill and set the angle.

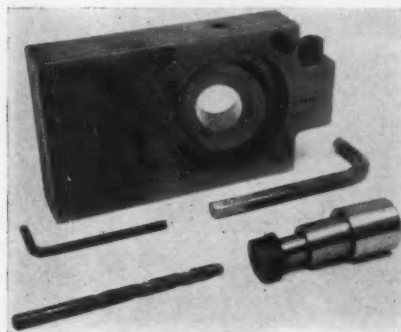
This problem recently was solved at Temco Aircraft Corp. The solution is a ball and socket-equipped drill block that is called "universal" by the firm because it fits any surface contour and secures the bit at any desired drilling angle.



B. C. Ballard a jig-builder designed the universal drill block, two of which now are stocked in Temco's main tool crib. It is conventional in size, measuring 3½" by 6½", and the tool steel from which it is made is 1½" thick.

The hole in Ballard's block—bored for a one-inch bushing—is centered in a ball which, in turn, is enclosed in a socket. Radius of both ball and socket is 2¼".

Since each has the same radius, the ball would be immovable, if Ballard hadn't made other provisions. He allowed the ball freedom to rotate within the socket by cutting the block through,



from one end of its juncture with the socket.

This cut widens the socket enclosure fractionally, and the socket itself—made of two separate, semicircular pieces, held in the block by set screws—widens just enough to give the enclosed ball sufficient clearance to move.

Thus, the ball, and the bushing hole within it, can be tilted to any reasonable degree for angle drilling. Once at the proper tilt, the ball can be secured in that position. This is done by tightening a cap lock screw which closes the cut in the block which, in turn, tightens the socket around the ball.

In cases where angles must be exact,

to fractions of degrees, the bushing hole angle may be pre-set on a sine plate.

Socket-head jack screws are threaded into the drill block at five different points—including the block's four corners. These screws can be run out of the base of the block so that they extend like legs. On an irregular surface, the screws' exposed length is adjusted so they make the block a solid platform, then the block is secured to the surface with a C-clamp.

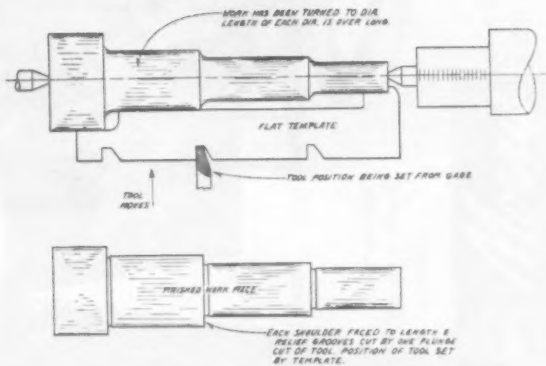
Temco uses the universal block principally for enlarging holes, but the device is equally well-suited for locating holes. It can be used with a hand-operated drill, or with a drill press.

Shoulder Facing Tool Setting Gage

By Richard Carpenter

Not all of us are fortunate enough to have available an automatic contour lathe for between centers work. However, by proper techniques the time involved in repetitive turning of stepped shafts can be substantially lowered. A simple template of the type illustrated will aid materially in rapid and exact shouldering after the shaft has been turned to its various diametral measurements.

The template can be made from ground flat stock laid out with a height gage, sawed out on the contour saw, and die filed to the scribed lines. The tool setting notches are cut along the side in the position corresponding to the desired location of each shoulder on the shaft. A hook on one end will position the template to the finished end shoulder on the shaft.



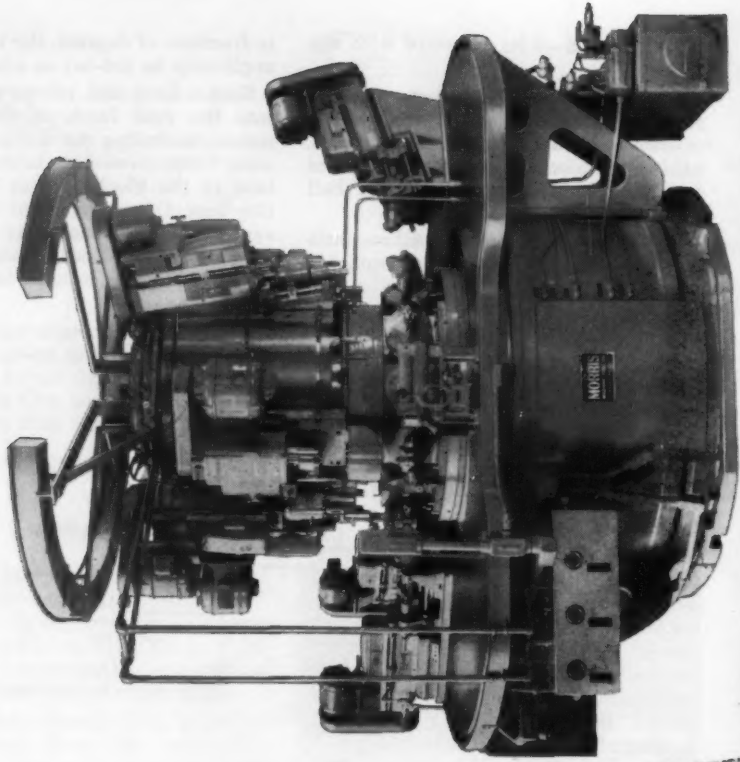
SHOULDER FACING TOOL SETTING TEMPLATE

To use the template the operator simply holds it against the work with one hand while he positions the tool into the appropriate notch and locks the carriage into this position. This operation is repeated for each shoulder.

It is efficient practice to shoulder and cut relief grooves by making a plunge cut with the same tool. When the run is completed the template can be stored away in the tool crib for use when the same job comes up for production again.

**Eliminates
model
change-over
problems!**

a production
machine—with
standard units—
quick change-over
features—for each
year's design change.
completely automatic—
requires only part
loading and unloading.



Morris Unit-Type Machine Tools provide specialized machining; use standard components; add flexibility to your high speed mass production operations.

Unit type construction provides for re-alignment for model alterations or for new models. No longer any need to scrap an entire machine!

MORRIS MOR-SPEED PRODUCTION MACHINE . . . drills, burrs, reams, taps, spotfaces carburetor air horns . . . 375 pieces per hour at 80% efficiency.

Basic construction provides a stationary center column and Morris AIR-OIL-MATIC Drill Units mounted on the column and on the removable platen. Parts are placed in the air-power clamped fixture by the operator. The table indexes automatically through 12 stations, controlled by hydraulic indexing mechanism. 24 operations on 21 holes on 4 perpendicular faces and one angular face are performed on each piece. Operator merely loads unfinished pieces, unloads completed parts.

Write for new detailed descriptive literature . . . or outline your mass production problem involving drilling or related operations for prompt attention by MORRIS engineers.

MORRIS AIR-OIL-MATIC DRILL UNITS

- Adjustable Feed, Stroke and Rapid Approach
- Trouble-free Hydraulic System
- Wide Range of Spindle Speeds • Convenient Controls
- Air or Oil Powered • Hydraulically Controlled

Designed for a wide range of drilling, reaming, chamfering, spot-facing, hollow milling, centering and related operations, the unit can be mounted in vertical,

angular or horizontal positions.

Controls may be set to provide almost any sequence of operation. Available for use in special purpose machines like the production machine illustrated.



VISIT US AT BOOTH #912
THE MACHINE TOOL SHOW
Chicago, Illinois, Sept. 6-17, 1955
International Amphitheater



THE MORRIS MACHINE TOOL CO.
937 HARRIET STREET • CINCINNATI 3, OHIO



Literature

CATALOGS AND BULLETINS AVAILABLE FROM MANUFACTURERS

For copies of the literature in which you have an interest use the postage-paid postcard between pages 234-235. Merely circle the identifying number and mail the postcard.

1. Protective Closures. To protect, seal, or mask threaded parts, pipe or tubing ends Shurclose caps and plugs—rubber and plastic—are described and sizes and specifications listed in a new Catalog 55-1 issued by Ray A. Scharer & Co., Dept. BM, 3000 E. Grand Blvd., Detroit 2, Michigan.

2. Investment Castings. "How Scott Investment Castings Can Benefit You" is the title of a new 4-page folder issued by Scott Casting & Manufacturing Corporation, Dept. BM, 116 W. Lancaster Ave., Berwyn, Pa. Specific examples of how investment casting can economically solve assembly and production problems are set forth. Costs and comparisons of this type of moulding method are graphically shown. Alloys and tolerances listed.

3. Precision Lathe. A new Sebastian 15" geared head precision lathe manufactured by Sheldon Machine Co., Inc., Dept. MB, 4258 N. Knox Ave., Chicago 41, Illinois, is illustrated in a 4-page circular. Close up view of important design features aid machinists in evaluating the machine. Accessories listed.

4. Tolerance Standards for multiple-thread milling cutters are available in a new four-page, illustrated reference manual (SC-2) available from Star Cutter Co., Dept. B, 34500 Grand River Ave., Farmington, Mich. Tolerances are given for precision ground, commercial ground, accurate unground and commercial unground classes of cutters.

5. Speed Measuring Instruments operated on principle of resonance are described and illustrated in an eight-page bulletin No. 770 released by Herman H. Sticht Co., Inc., Dept. BM, 27 Park Place, New York City 7. Vibrating reed tachometers require no contact with rotating shafts or moving machine parts. Available in portable or stationary models.

6. Conveyor Rollers. Five distinct rollers with interchangeable parts are featured in a new folder by Stilson Tool, Inc., Dept. MTB, 30233 Groesbeck Hwy., Roseville, Mich. All-Neoprene cushion conveyor rollers which vary in design and density, are pictured in various installations. Specifications as well as assembly details are included.

NEW

MILLERS FALLS No. 50C ELECTRIC SCREW DRIVER

- TWICE THE DRIVING POWER
- GREATER CAPACITY — wood screws up to #12 x 1½" — machine screws to ¼"
- MUCH LONGER BRUSH LIFE
- BUILT-IN REVERSING SWITCH
- INTERCHANGEABLE SWITCH LEVERS (Paddle or Butterfly)

Plus

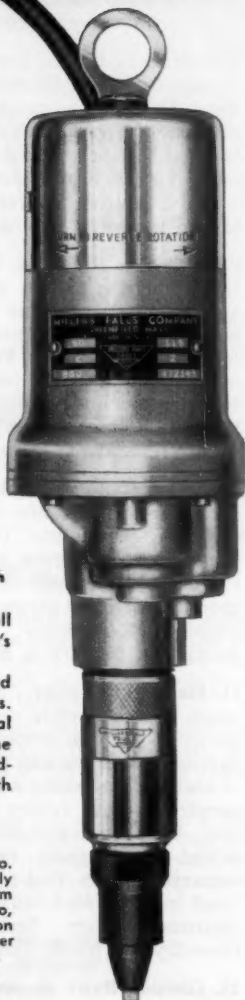
the famous, super-sensitive
ADJUSTOMATIC® CLUTCH



Butterfly Switch



Paddle Switch



For years, the Millers Falls No. 50 has been the most successful of all electric screw drivers. Now — in this remarkable new Model 50C — it's even better — more powerful, more versatile than ever before.

In fact, its range of uses is so wide that it entirely supersedes and replaces all four of the previous No. 50 and No. 52 Series screw drivers.

Whether you are assembling delicate eyeglass frames with tiny optical screws or driving 1½" #12 screws in hardwood, you can count on the new 50C for outstanding performance. It's fast, powerful and dependable — and the patented "Adjustomatic" Clutch assures velvet smooth operation with precision torque control month after month.

**MILLERS FALLS
TOOLS**

SINCE
1868

The Mark of Superiority

FREE DEMONSTRATION

Let us show you how the new No. 50C Screw Driver cuts assembly time — gives better, more uniform work at lower cost. Write, too, for literature on the 50C and on Millers Falls wide line of other high-performance electric tools.

MILLERS FALLS COMPANY
Dept. MT-8, Greenfield, Mass.

7. Die-Draulic Grip. Designed and perfected by "die men" the Barret Die-Draulic Grip manufactured by Die-Draulic Grip, Inc., Dept. MB, 528 Butterworth St., S.W., Grand Rapids, Mich., answers the problem of efficiently holding stock in position in a die during drawing or forming. Five steps to determine your requirements are outlined in an accompanying circular.

8. Reference Books. South Bend Lathe Works, Dept. BB, 425 Madison St., South Bend 22, Ind., has announced the publication of two books, "Machine Shop Projects," which sells for \$2.00 a copy and "How to Run a Lathe," which is a valuable source of reference for the skilled machinist selling for 50 cents.

9. Protective Helmets. Reinforced and high pressure plastic, glass fiber, and aluminum are various materials from which Mine Safety Appliances Co., Dept. MT, 201 N. Braddock, Pittsburgh 8, Pa., manufactures protective headgear. A 16-page brochure No. 0600-3 describes the testing processes employed to assure uniform standards of protection.

10. Die Handling Problems in various shop departments are discussed in an eight-page bulletin, "Di-Lifts in Action." How to figure possible savings by using Di-Lifters is included with specifications and prices of six standard models. Montgomery Tool Co., 24A Austin St., Newark 5, N.J.

11. Hardness Tester. Soft plastic to tough steel! A newly developed instrument—Dyhedron Tester—determines dynamic hardness and natural lubricity of materials by using a shaped diamond penetrator with rotary oscillating motion. Used to complement results obtained with regular testers with stationary indentors. Test procedure is outlined in illustrated bulletin 5501. Taber Instrument Corp., Section 181-B, 111 Goundry St., North Tonawanda, N.Y.

12. Gamma-Ray Inspection. Now a

practical low cost industrial tool, Gamma Radiography is effective in testing steel and heavier materials. Principles . . . applications . . . equipment are discussed in a 12-page brochure published by Technical Operations, Inc., Dept. BTM, 6 Schouler Court, Arlington 74, Mass.

13. The Join'ng of Crucible Rezialst Stainless Steels, a newly revised 24-page booklet, describes 17 methods employed in joining stainless steel by fusion processes—manual, automatic, semi-automatic welding, brazing, soldering—and 8 flame and arc cutting procedures for severing stainless steel. Write to Advertising Dept., Crucible Steel Co. of America, Box 88-B, Pittsburgh 30, Pa.

14. Rust Preventive Use Chart. Purchasing agents or packaging engineers engaged in preservation of metal products will refer to Chart No. 255. Characteristics of rust preventive oils and compounds are described, and products used for machine tool lay-a-way and other government contracts requiring preservative packaging are listed. Available from Nox-Rust Division, Daubert Chemical Co., Dept. BB, 333 N. Michigan Ave., Chicago 1, Ill.

15. Subland Tools. Since care must be exercised in the selection and use of subland tools, comparative advantages of these tools over standard and step drills are discussed in a new cutting tool bulletin issued by Detroit Reamer & Tool Co., Dept. BB, 2830 E. 7 Mile Road, Detroit 34, Michigan. Multi-purpose subland tools are also discussed.

16. Metal Stampings in small lots—with lowest possible die costs—and short-run plastics—with lowest possible mold costs—are specialties of Dayton Rogers Mfg. Co., Dept. BB, 2823—13th Ave., S., Minneapolis 7C, Minn. Quick facts about both services as well as illustrations of their other products are set forth in Bulletin F-225.

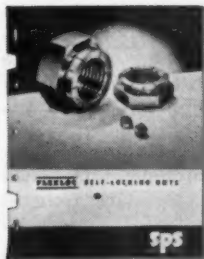
FLEXLOC AT WORK



MORE AND MORE FLEXLOC LOCKNUTS are being used on applications where dependable locking is essential to the operation of the equipment and the safety of the operator. This bundling chain with automatic lock provides positive grip and safe, sure bundle handling.

Two FLEXLOC Self-Locking Nuts hold this assembly together. Once the locking threads are fully engaged, the nuts won't work loose, regardless of the conditions under which they are used.

FLEXLOC one-piece, all-metal nuts are available in a full range of sizes in any quantity. Standard FLEXLOCs are stocked by leading industrial distributors everywhere. Write for Bulletin 866 and samples. STANDARD PRESSED STEEL CO., Jenkintown 52, Pa.



FLEXLOC LOCKNUT DIVISION

sps
JENKINTOWN PENNSYLVANIA

17. Abrasive Belt Machines. Savings in time, labor spoilage and space costs are explained in a 23-page catalog, "Abrasive Belt Machining," which describes five types of abrasive belt machining. Application methods of their complete line is also a feature of the catalog released by Engelberg Huller Co., Dept. B, 831 W. Fayette St., Syracuse 4, N.Y.

18. Gage Blocks. For extremely accurate measurement control in metal-working gage blocks available in chrome plate and steel are purchased by Swedish-trained craftsmen at the Freeland Gauge Co., Dept. BB, 9940 Freeland Ave., Detroit 27, Mich. Product photos, complete specifications and description of their inspection service is given in a new brochure.

19. Multiple Thread Cutters. Tolerances and classifications standardized by Metal Cutting Tool Institute for multiple thread cutters are included in an eight-page bulletin No. 121 issued by Goddard & Goddard Co., 12282 Burt Road, Detroit 23, Mich. Maintenance information is also included.

20. Aluminum Forgings. Grain control, light weight, excellent finish, and ease of machining are among the advantages described in a 12-page booklet, "Aluminum Forgings," published by Technical and Development Division, Dept. B, Harvey Aluminum Co., 19200 S. Western Ave., Torrance, Calif. Press forgings, impact extrusion, and hand forgings are also described.

21. Waterproof Tapes. Controlled strength—the proper combination of adhesive and backing material—is described in a new tape brochure issued by Polyken Products Div. of The Kendall Co., Dept. B, 222 W. Adams St., Chicago 6, Ill. Typical uses of each of the three new tapes are illustrated.

22. Ground Thread Taps. A timely bulletin No. T-583 explaining the revision

of tap standards as adopted by the Metal Cutting Tool Institute effective February 1, 1955, is being released by Pratt & Whitney, Dept. B, West Hartford 1, Conn. Conversion, general dimension, and thread limit tables are included as well as regular listed ground thread taps and tap recommendations.

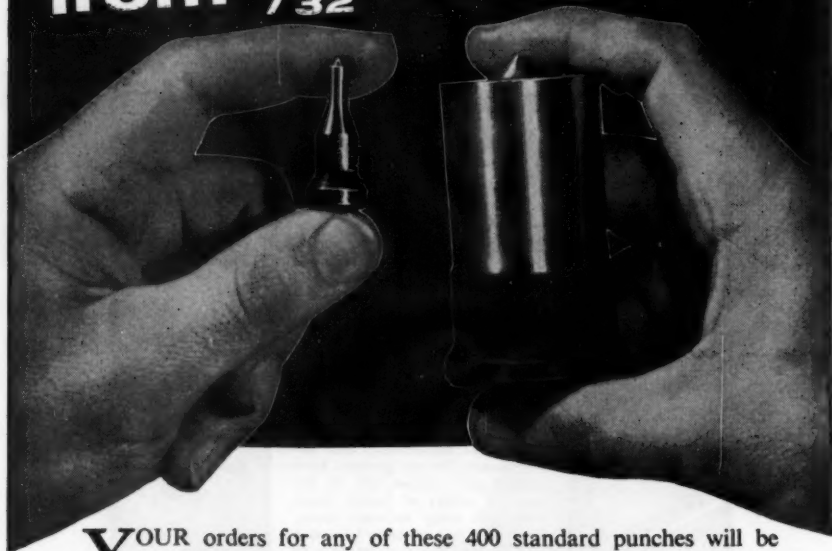
23. Steel Bars. "New Super La-Led Replaces Brass." This new four-page booklet released by LaSalle Steel Co., Dept. BB, 1412—150th St., Hammond, Ind., explains why new cold finished steel bar greatly increases production. Said to machine cleanly to a fine satin appearing finish. Chemistry, physical properties and available sizes included.

24. Oil Filters. Featuring quick-opening covers; easy-to-change cartridges; choice of 6 filter media; and electric, steam or hot water heat a complete new line of Honan-Crane multi-cartridge oil filters has been announced through a new bulletin No. 201 by Filtration Division, Dept. MTB, Houdaille-Hershey of Indiana, Inc., 26 South Ave. Lebanon, Ind. Dimensions and specifications included.

25. Pickling Operations. Greater production in the processing of large and small fabricated parts, hollow ware, and forgings and castings, as well as the common millforms of steel and tin plate, through the use of specially designed Monel equipment is described in a 32-page booklet, "Equipping the Pickle House," offered by Dept. LB, International Nickle Co., Inc., 67 Wall St., New York 5, N.Y.

26. Work-Holding Equipment. Designed to simplify ordering procedures General Catalog No. 101 of Jergens Tool Specialty Co., Dept. BTM, 712 E. 163rd St., Cleveland, 10, Ohio, introduces an illustrated index embracing 23 categories. All jig and fixture components are identified by drawings and catalog num-

400 Standard Cleveland Punches from $\frac{5}{32}$ " to $1\frac{1}{2}$ "



YOUR orders for any of these 400 standard punches will be filled promptly from stock. Naturally they cost less than special punches. What's more, when you order Cleveland punches you're sure of getting quality tools backed by years of specialized experience. We're constantly experimenting with various steels and processes so that we can give you the very best.

Are your punching machines equipped to use standard Cleveland punches? If not, it will pay you to investigate the many advantages of standardization.

AA-405



Diamond Anniversary



Established 1880

POWER PRESSES — FABRICATING TOOLS

City Foundry Division • Small Tool Department

E. 40th & St. Clair Avenue • Cleveland 14, Ohio

NEW YORK • CHICAGO • DETROIT • PHILADELPHIA • E. LANSING • OXFORD, O

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bers. Assemblies shown by detailed drawings. Descriptions brief.

27. New Catalogs. The Lufkin Rule Co., Dept. BB, Saginaw, Mich., announces the publication of two new catalogs; No. 8 is a 160-page precision tool catalog, No. 104 a 160-page tape and rule catalog. Each pocket size book is an excellent handbook and buyer's guide for precision tool users.

28. Precision Metalworking Production facilities of the six plants of the New

Process Gear Corp., Dept. B, 500 Plum St., Syracuse, N.Y., are described in a new 24-page booklet, "Geared for Research, Design and Production." Various engineering services available to manufacturers are also listed. Requests should be made on company letter-heads.

29. Wire and Pipe Markers. A special pressure sensitive tape resists heat up to 400° F and insures permanent identification in various surfaces with no effect from cold, humidity and vibration. North

WORLD'S HARDEST METAL

BUSHINGS

BLADES

ROLLS

TOOLS

DIES

BAR STOCK

IMPROVED QUALITY

Additional refinements and improvements in our process have added still longer life to the wearing edges of Talide tools, dies and wear resistant parts. The result is a carbide having a new, unique grain structure with harder and tougher properties than previous grades. Laboratory tests reveal our improved grades possess 25% greater strength and rigidity. Service life per grind up to 50% longer than previous grades has been proven in grueling field tests.

METAL CARBIDES CORP.,
YOUNGSTOWN 7, OHIO

Write for Catalog 55-G

METAL CARBIDES CORPORATION
TALIDE®
YOUNGSTOWN 7, OHIO

HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • CERMETS • HIGH TEMPERATURE ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

Shore Nameplate, Inc., Dept. BM, 214-27 Northern Blvd., Bayside, L.I., N.Y., has released two catalogs of Speedy-Marx wire markers and pipe markers.

30. Wall Chart. General engineering, heat-resisting, corrosion-resisting, and wear-resisting types of Meehanite castings available to industry are summarized in tabular form in a wall chart prepared by the Meehanite Metal Corp.,

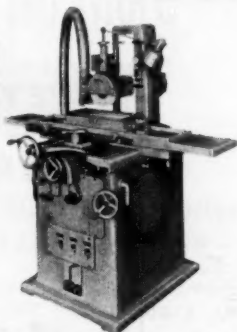
Dept. MTB, 714 North Ave., New Rochelle, N.Y. Basic facts about metallurgy of Meehanite castings are included.

31. Toolholders. Styles and sizes to fit every production need are indexed in a new catalog (VR-435B) by VascoIoy-Ramet Corp., Dept. B, 800 Market St., Waukegan, Ill. Offers toolholders for round "Throw-Away" carbide blanks and round 1½" long carbide inserts.

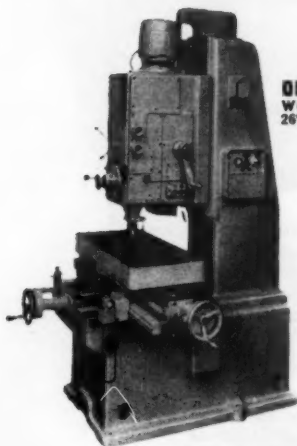


**ULTIMATE IN PRECISION
REASONABLE IN PRICE**

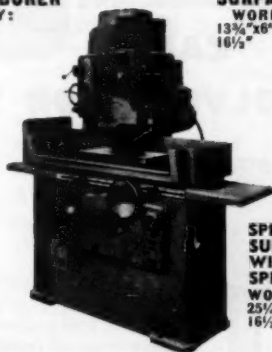
**SURFACE GRINDERS
AND OPTICAL JIG BORER**



SURFACE GRINDERS
WORK CAPACITIES:
13½"x8", 24"x8", 49¼"x
16½"



OPTICAL JIG BORER
WORK CAPACITY:
26"x17"



**SPECIAL
SURFACE GRINDER
WITH VARIABLE
SPINDLE SPEEDS**
WORK CAPACITIES:
25¼"x15¼", 49¼"x
16½"

Some territories still available to reputable agents
or dealers. Write for particulars.

THE CEE MACHINERY COMPANY

21-25 44th Ave., Dept. T-1 **CEE** Long Island City 1, New York

Valuable tips given on using new tool-holders with 35 degree end clearance angle. Six other styles illustrated. New low prices quoted.

32. Brazing. Boost brazing production issue of **Low-Temperature Brazing News**, No. 68, is offered by Handy & Harman, Dept. BM, 82 Fulton St., New York City 38. Suggestive Easy-Flo brazing setup pictured, also several plant setups.

33. Self-synchronous Motors. Dimensional drawings, characteristic curve, and electrical data supplement the description of various commercial types of self-synchronous motors manufactured by Electric Indicator Co., Inc., Camp Ave., Dept. MT, Springdale, Conn. Folder EI-5A lists design characteristics of over 30 models.

34. Blind Rivets. Lower unit costs . . . reduced assembly time . . . better prod-

HAVE YOU A PUMP PROBLEM ?

Ruthman CAN SOLVE IT FOR YOU



Illustrated is a Storm-Vulcan #75 Camshaft Grinder on which Ruthman Gusher Coolant Pump is standard equipment.



If you have a centrifugal pump problem, we can help you solve it. As originators of the motor driven machine tool coolant pump, Ruthman has developed many types of centrifugal pump applications including coolant pumps, agitators, molten metal pumps, etc. Send us complete information on your pump requirements, perhaps one of our many models with slight modification will solve your specific problem.

THE RUTHMAN MACHINERY CO.

1816 READING ROAD

CINCINNATI, OHIO

Encircle No. 303 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



Star Quality

Costs No More

why not get these

**SAFE,
UNBREAKABLE**

*high speed blades
from your STAR Distributor?*

For over 75 years, industry has known STAR Hand and Power Hacksaw Blades as *quality* blades.

Here, as an example, is the STAR Unbreakable High Speed Steel Blade — safe, fast-cutting, long-lived. The STAR combination of a flexible steel back, special-process weld and high speed steel cutting edge adds up to an efficient, shatterproof, proved-quality blade.

STAR SERVICE COSTS NO MORE

Order any of the complete line of STAR Blades from your Industrial Distributor — your best source of supply for hundreds of the items you need to operate efficiently, economically, and without production interruptions.

Sold Only Through Recognized Distributors

CLEMSON BROS., Inc.

MIDDLETOWN, N. Y., U. S. A.

Makers of Hand and Power Hack Saw Blades, Frames, Metal Cutting Band Saws and Clemson Hand and Power Lawn Machines.



Ⓢ 1018

Encircle No. 309 on Card, Opposite Page 65

July, 1955

165

uct design are claimed for Townsend commercial blind rivets which are illustrated in a two-color brochure, TL-99. Description of use for quick, secure, and economical fastening included. Proper selection aided by material thickness and drill size charts, also lists of stock sizes. Townsend Company, Dept. B, New Brighton, Pa.

35. Lift Trucks. How efficient handling increased warehouse capacity 300% is

related in certified job study No. 139 released by Towmotor Corp., Dept. BMT, 1226 E. 152nd St., Cleveland 10, Ohio. Benefits of lift trucks in sorting materials, unloading jobs, etc. discussed.

36. "For Your Metal Money's Worth," a 20-page pocket size booklet describing Titan brass rod mill products has been released by Customer Service Division, Dept. BB, Titan Metal Manufacturing Co., Bellefonte, Pa. Products described

FREE BOOKLET
... tells how to judge diamond quality.

SEND FOR YOUR COPY TODAY!

Most up-to-date information available. Helps you use diamond better, more efficiently. Serves as guide when buying or using diamond.

FACTS YOU SHOULD KNOW
WHEN BUYING AND USING DIAMONDS
Booklet No. 1 Diamond Series

ABRASIVES DIVISION
ELGIN NATIONAL WATCH COMPANY
ELGIN, ILLINOIS

Elgin Diamond is the standard for industrial diamond quality. Only Elgin offers this Master Comparison Gage to let you check your own diamond for grading and purity.

ABRASIVES DIVISION, DEPT. K

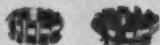
ELGIN NATIONAL WATCH COMPANY
ELGIN, ILLINOIS



Encircle No. 310 on Card, Opposite Page 65



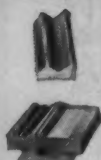
GROUND
MULTIPLE
THREAD
MILLING
CUTTERS



FORM RELIEVED
MILLING CUTTERS



SINGLE POINT
TOOLS



FORM TOOLS

SEE EX-CELL-O
AT THE
MACHINE TOOL
SHOW
CHICAGO, SEPT. 6-17
BOOTH 1319

55-31



REAMERS

FACE MILLS

CONTINENTAL DRIVE TOOLS

Why These Cutting Tools are *Production Proved*

Continental is an Ex-Cell-O subsidiary.

As such, we are constantly trying out new tool designs, new methods, in Ex-Cell-O's big parts production shops.

There could be no finer "proving ground" for testing new materials and new methods. There are no finer cutting tools than "Production-Proved" tools by Continental.

Call in your Ex-Cell-O representative or contact Continental in Detroit for information about them.

Continental

TOOL WORKS

Division of Ex-Cell-O Corporation, Detroit 32, Mich.

are free-cutting brass, naval brass, manganese bronzes; free-cutting commercial bronze rods; forging rods and shapes; brass wire—for cold heading of rivets, bolts, etc.; weights tables and specifications.

37. Low Pressure Liquid Meter. A new line of all-ferrous Rotocycle meters and accessories is illustrated in Bulletin O.G. 408 issued by Meter and Value Division, Dept. BTM, Rockwell Mfg.

Co., 400 N. Lexington Ave., Pittsburgh 8, Pa. A broad range of sizes facilitate their use for metering low pressure industrial liquids as well as aqueous ammonia and ammonium phosphate.

38. "Product Standards for Die Castings," a part of a series published by American Die Casting Institute, Dept. MBT, 366 Madison Ave., New York City 17, and available from job shop die casters who are members of the Institute. Standards

HARDNESS CONVERSION CHART

**For Every Shop That Does
Hardness Testing**

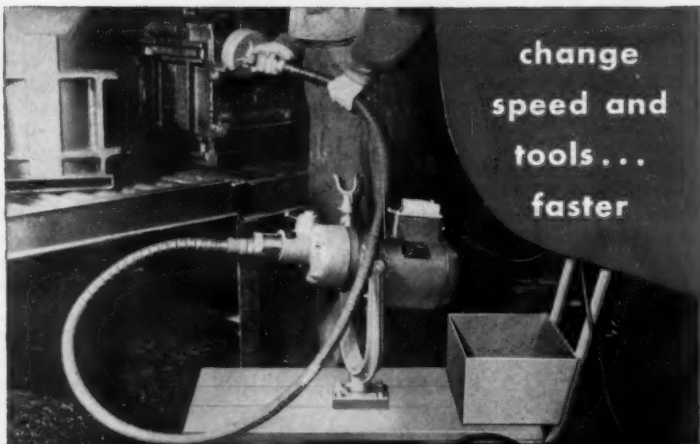
This latest and most nearly accurate Hardness Conversion Chart is a necessity wherever hardness testing is done. It has been compiled and produced by CLARK, makers of the internationally respected CLARK Hardness Tester for "Rockwell Testing." Printed on heavy stock convenient for wall mounting, the chart is offered free of charge to hardness tester users. Just attach this ad to your letterhead or write "Send wall chart." A copy will be mailed to you without charge or obligation.

P.S. If you would also like information on CLARK Standard and Superficial Hardness Testers, we'll be glad to send that along too.

CLARK
INSTRUMENT
INC.



**CLARK
INSTRUMENT
INC.**
10206 Ford Road
Dearborn, Mich.
U.S.A.



with exclusive *Strandflex* 4 & 5 speed
GEAR DRIVE FLEXIBLE SHAFT MACHINES

ONE COMPACT UNIT gives you gear-shift selection of any of 4 or 5 speeds ranging up to 12,000 RPM . . . plus push-button tool changes. You cut machinery costs by putting a single power source to work for **GRINDING, ROTARY FILING, BRUSHING, SANDING, DRILLING, POLISHING, BUFFING, CLEANING.**

4 AND 5-SPEED STRANDFLEX GEAR DRIVES provide faster speed selection by eliminating countershafts, drive belts and pulley changes. You change speeds by little more than a flick of a finger . . . no need to use tools. Wider speed range lets you use Strandflex for more jobs, too.

QUICK-CHANGE COUPLING lets you change tools with a simple **PRESS-PULL-SNAP** action without using wrenches. Strand shafts and attachments are designed for tough use, even in hard-to-get-at jobs as well as production work.

FROM JOB TO JOB, the power source is easily moved on one of a wide variety of portable mountings. In use the operator lifts only the lightweight handpiece, not the heavy motor . . . thus reducing fatigue and increasing production.

NEW CATALOG describes **FULL LINE** of Strand Flexible Shaft Machines, including direct drive and countershaft models with up to 3 HP; also accessories and tools. See your Distributor or write direct for Catalog C-210A.



covered at present time are linear dimension, parting line, moving die part and flatness tolerances and draft requirements for walls. Lists of members upon request.

39. 1955 Buyers' Guide for design of screw machine products, a third edition, published by National Screw Machine Products Assn., Dept. MTB, 2860 E. 130th St., Cleveland 20, Ohio, is edited for maximum efficiency in designing

and specifying screw machine products. Topics covered include deliveries, conditions of sale and manufacturing practices, threads, what increases costs, plating and heat treating, etc. Fully illustrated. Valuable as a quick reference.

40. Threading Machine. A double spindle production machine, the 6B Landmaco threading machine is described in Bulletin No. D-80 issued by Landis Machine Co., Dept. MB, Waynesboro, Pa. Ex-

NEW SWIVEL-ACTION
BURRQWIK
HAND DEBURRING TOOL

*pays for itself
in one day!*

Patent No. 2598443

the
**UNIVERSAL
ANSWER**

Deburs 4 jobs for every 3 deburred with old-style tools. Patented swivel-action leads blade along edges...no more nicks, scallops, or wrist and arm fatigue.

Hardened high speed tool steel interchangeable blades—small blade for tubing and small holes—a larger blade for straights, radii and large tubing.

Use BurrQwik for all metals and plastics—for cut, punched, molded and processed edges.



TRIAL SAMPLE!

Without obligation...test—try BurrQwik on your own production jobs—prove its value!

Rated companies may request on letterhead a complete BurrQwik set 500. Act today! Include name and address of your regular industrial supply house.

Anodized aluminum handle and 2 blades, in tough vinylite Pocket Pak—ready for instant use!

A WORLD OF KNOW-HOW
ENGINEERING, MACHINING, WELDING,
METAL STAMPINGS, AIRCRAFT PARTS



Universal
METAL PRODUCTS, INC.

411 VINELAND ST., BASSETT, CALIF. • KANSAS CITY, MO. BRANCH: CONGRESS BLDG., 3327 BROADWAY

Encircle No. 314 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



Why hats are off to CIMCOOL...

...because CIMCOOL[®] has become, in just a few years, the largest selling cutting fluid in the world. And sales of this radically new and different coolant are continuing to climb because CIMCOOL Standard Concentrate has two big advantages over old-fashioned cutting fluids.

CIMCOOL LOWERS COSTS because it's longer lasting in machines. Thus, it reduces downtime and cuts labor costs for cleaning and changing.

CIMCOOL DOES A BETTER JOB because of its chemical lubricity. It permits faster speeds and increases tool life, for it combines friction reduction and cooling capacity in a degree never before attained.

We'll be happy to supply information on the many specific advantages of CIMCOOL Standard Concentrate—or details on the entire family of CIMCOOL Cutting Fluids. Just contact us. Wire, write, or telephone Sales Manager, Cincinnati Milling Products Division, The Cincinnati Milling Machine Co., Cincinnati 9, Ohio.

[®]Trade Mark Reg. U.S. Pat. Off.

CIMCOOL CUTTING FLUIDS

CIMCOOL Concentrate—The famous pink fluid which still covers 85% of all metal cutting jobs. Effective, economical and clean.

CIMCOOL Tapping Compound—Permits the use of highest tapping speeds and increases tap life amazingly.

CIMPLUS—The transparent grinding fluid with exceptional rust control. Also used for machining cast iron and as a water conditioner with CIMCOOL Concentrate.

CIMCUT Base Additive—For jobs requiring an oil-base cutting fluid. Added to mineral oils, it gives an economical mix for higher speeds and feeds.

CIMCOOL Bactericide—The most effective agent yet developed to overcome rancidity and foul odors.

CIMCOOL Machine Cleaner—The two-phase non-corrosive cleaner that removes grit, dirt, slime and oil.

CIMCOOL
Cutting Fluids

100%
for ~~85%~~ of all metal cutting jobs

PRODUCTION-PROVED PRODUCTS OF THE CINCINNATI MILLING MACHINE CO.

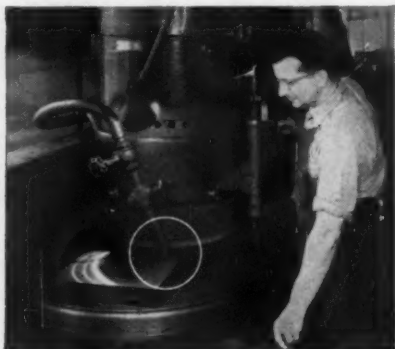
cellent photographs with accompanying legends aids the explanation of the various design features—headstock, operating controls, coolant system, etc. Specifications included.

41. Buyers' Guide. To assist buyers of gears and to make known the range of products offered by British manufacturers, a Buyers' Guide has been prepared by British Gear Manufacturers' Assn., P.O. Box 121-B, 301 Glossop Rd.,

Sheffield 10, England. A general index lists manufacturers of gears and gear cutting, gear units, gear cutting tools, gear grinding, gear hardening, and gear production machinery. Under a list of manufacturers the range of products of each is given.

42. Industrial Trucks. Gasoline powered . . . electric platform . . . electric crane . . . battery powered fork . . . are a few of the types illustrated in an eight-

Surface
grinding
customers
report:



Nothing equals the G Bond

Your own surface grinding will benefit by the Norton G Bond's unique ability to hold each abrasive grain just long enough for maximum cutting action. This important "Touch of Gold" advantage means:

Freer, cooler, faster cutting . . . heavier cuts without burning closer tolerances and smoother finishes . . . easier dressing and more pieces per dressing . . . more work from longer lasting wheels.

See your Norton Distributor for the G Bond wheels, cylinders, segments you need. Ask him about 32 ALUNDUM* abrasive, designed for fast stock removal and heavy feeds. Or write to NORTON COMPANY, Worcester 6, Mass. Distributors in all industrial areas. Export: Norton Behr-Manning Overseas Incorporated, Worcester 6, Massachusetts.

W-1647

*Trade-Mark Reg. U. S. Pat. Off. and Foreign Countries



*Making better products . . .
to make your products better*

and its BEHR-MANNING division

NORTON COMPANY: Abrasives • Grinding Wheels • Grinding Machines • Refractories
BEHR-MANNING DIVISION: Coated Abrasives • Sharpening Stones • Pressure Sensitive Tapes

Encircle No. 315 on Card, Opposite Page 65

page bulletin on trucks issued by Baker-Raulang Co., Truck Division, Dept. B, 1230 W. 80th St., Cleveland 2, Ohio. To aid in proper selection and application of the trucks tables of dimensions, capacities, weight, and lift height are given.

43. Pneumatic Temperature Control. Operated by the differential expansion of solids the new Burling Model DA is available for temperatures up to 1800°

F. Photographs, diagrams, and cut-away views aid in clarifying the description and specifications of Models DA and HA in Bulletin 1951 released by Burling Instrument Co., Dept. MB, 16 River Road, Chatham, N.J.

44. Safety Step Ladders. Sturdy hand-rails, smooth-rolling ball-bearing retractable casters, rubber covered steps and lightweight construction are some features of the new aluminum safety-

"RFC" ROLL-FEEDS

FITS ANY PRESS

For side or rear feeding. All attachments for installing furnished, including disc and connecting linkage.

CAN'T SLIP

Each wedge has four points of contact to safeguard accuracy.

REVERSES INSTANTLY

Merely shift feed finger spring from one lug to the other.

FEEDS IN THOUSANDTHS

Amazingly accurate stock movement assured.

MAINTAINS ORIGINAL SETTING

Regardless of use or wear. No ratchets or pawls to wear down and "Throw off" feed spacing.

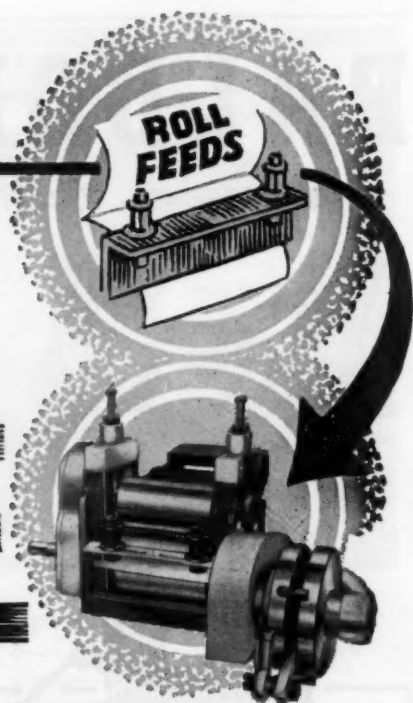
Ready for mounting! Furnished complete.

Write today for
latest Bulletin.

EARLY DELIVERY ON STANDARD MODELS

Roll-Feeds Corporation

ASHTON, R. I.



step ladders of tough all-welded aluminum tubing. There are seven models for working levels up to 8'. Ballymore Company, Dept. MT, Wayne, Pa.

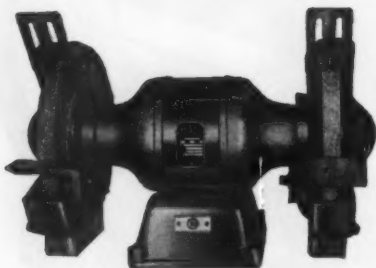
45. Self-Aligning Swivel Joints. Recently revised by Barco Mfg. Co., Dept. J-27, 501 Hough St., Barrington, Ill., "Swivel Joints for Piping (Catalog 265-B)," is said to be most comprehensive bulletin published on subject and contains complete specifications, dimen-

sions, and application data for the Barco line of joints. Ordering information is clearly outlined. Well illustrated.

46. Insulated Mountings for Precision Instruments. A specially designed cone shaped flexing member permits this unusually compact mounting device, "Instrument," to carry a wide range of loads. Silicone rubber, neoprene, and rubber are the different compounds used for various operating conditions.

BALDOR GRINDERS

BALL BEARING - TOTALLY ENCLOSED - HEAVY DUTY



Baldor Grinders are available in bench and pedestal types with 6" to 12" wheels. Baldor Grinders are better because:

More Rugged — Arbor diameter $\frac{3}{4}$ " and "sealed-for-life" ball bearing Size .05.

More Versatile — Wide clearance between wheels and motor frame permits grinding of large or odd shaped pieces.

Baldor is a basic manufacturer of grinders—even the motors are built by Baldor.

Baldor 10" Series Grinder $\frac{3}{4}$ h.p., 1 phase, 60 cy., 1725 rpm, 10" wheel. \$134.00



Special Carbide Tool Grinder built especially for sharpening carbide tools quickly and accurately. Reversible $\frac{1}{2}$ h.p., motor withstands repeated overloads. \$149.00.

BALDOR ELECTRIC COMPANY
4368 DUNCAN AVE. ST. LOUIS 10, MO.

Bulletin 5255 is packed with information of the various uses of "Instrument" manufactured by Bushings, Inc., Dept. BM, 4358 Collidge Hwy., Royal Oak, Mich.

47. Disc Clutch. Economical power transmission from source to point of use, dependability, and efficiency in manufacturing operations result from the use of Series 1700 geared-tooth drive disc clutch manufactured by the Con-

way Clutch Co., Dept. BM, 1105 Marshall St., Cincinnati 25, Ohio. Catalog 17-T tells the story of these larger Conway disc clutches with horsepower from 24 to 75 at 100 rpm. Photographs and drawings with explanatory dimensions graphically illustrate various clutches in series; clutch parts as well as a sampling of various types of clutches manufactured are also illustrated.

A black and white photograph of a Swanson Turret Indexing Unit. It features a large, circular turret with multiple indexing positions, mounted on a sturdy, rectangular base. The unit is shown from a slightly elevated, side-on perspective.

Swanson **TURRET INDEXING UNITS**

Provide a basic chassis to save time and cost in designing and building special automatic machines for a wide variety of manufacturing operations.

VERSATILE
ACCURATE
RUGGED

These complete* ready-made units are available on short delivery to help solve your automation problems NOW.

**furnished with drive and motor*

ENGINEERS and BUILDERS of SPECIAL AUTOMATIC MACHINES

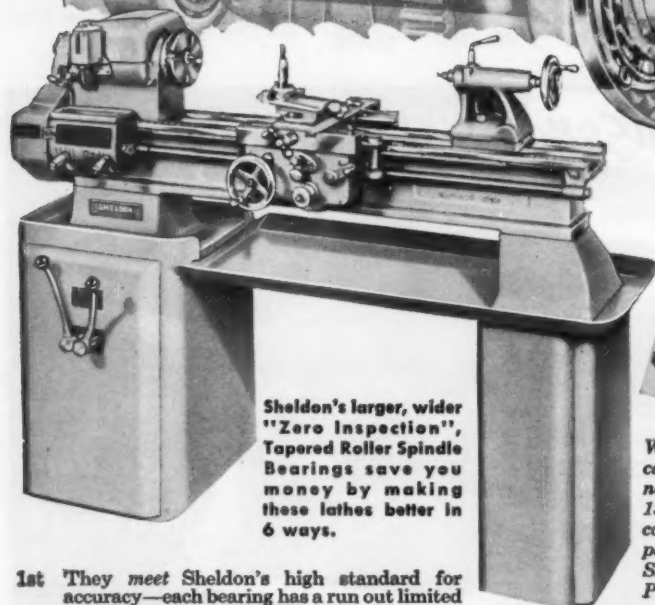
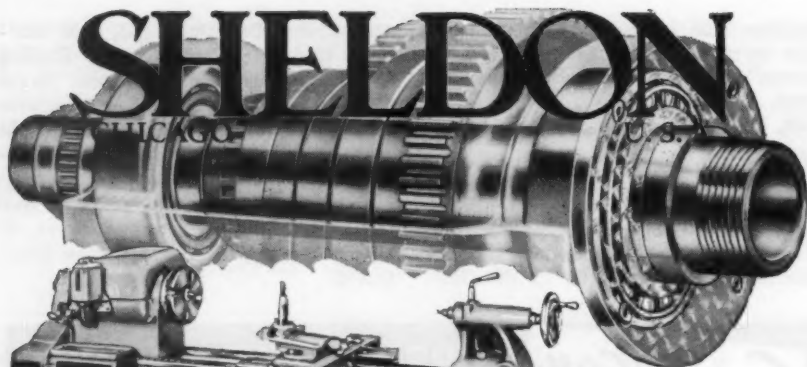
STANDARD UNITS:

20" — 30" — 40" Turret dia.
6 — 8 — 16 — 24 — 32 work stations.

1 to 4700 indexes per hour.

• Write for bulletin TMB •





Sheldon's larger, wider
"Zero Inspection",
Tapered Roller Spindle
Bearings save you
money by making
these lathes better in
6 ways.



Write for G-55
catalog showing
new 10" 11" and
13" swing, bench,
cabinet and
pedestal mounted
Sheldon
Precision lathes.

- 1st They meet Sheldon's high standard for accuracy—each bearing has a run out limited to .00015"
- 2nd They absorb thrust and radial loads beyond requirements—basic rating on front bearing at 500 R.P.M.
- 3rd They end costly bearing maintenance—require only a fractional turn of bearing take-up after long periods of service.
- 4th They hold the spindle in rigid alignment while permitting it to turn freely at high or low speeds—the line contact between rolls and races, and the opposing taper design, preclude lateral movement or end play.
- 5th They minimize friction—smooth mirror finished rollers and races running in light oil, deliver more horsepower at the Spindle Nose and lower power costs.
- 6th They increase work capacity. Larger than similar type bearings on other lathes in this price range, these bearings make it possible to turn out more work and better work at lower costs.

for radial loads 3540 lbs.
thrust loads 2335 lbs.

SHeldon MACHINE CO., INC.
4242 NORTH KNOX AVE. • CHICAGO 41, ILLINOIS

See SHeldon, BOOTH 702, COLISEUM MACHINERY SHOW, CHICAGO—September 6-17

Encircle No. 319 on Card, Opposite Page 65

W

hat's

new

in Metalworking

Line of Vertical Turret Milling Machines Introduced

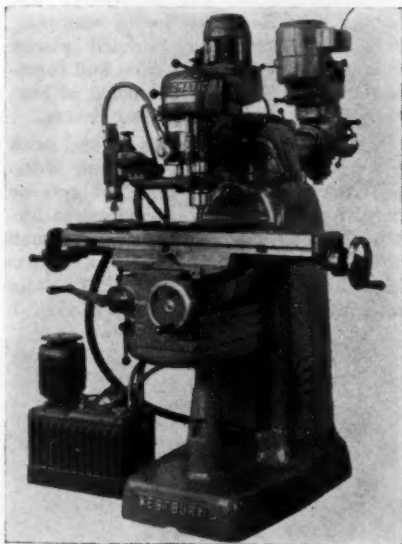
A line of turret milling machines with a number of new features has been announced by the Maserati Corporation of America, Dept. BB, Westbury, N.Y.

Called the Westbury 1-S and 1-R, the former has a dovetailed overarm and the latter a round overarm.

With an all angle milling head, the machines feature hardened and ground high-speed ball bearings spindles and a 5" power-fed quill travel with micrometer depth stop.

There are three feeds—.0016, .003 and .005—and rapid spindle change over 8 speeds, from 80 to 2,713. Angle setting is simplified by a precision control.

The rigidly mounted table is 42 $\frac{3}{4}$ "x 9-1/16". Longitudinal range is 30" with 10" traverse and a 16" vertical. Weighing 2200 lb., the machine occupies a floor area 88"x80". It has a 1 $\frac{1}{2}$ hp motor-driven head. The Dupromatic hydraulic tracing attachment converts it into a fully automatic copying ma-



chine with longitudinal and cross power feeds, automatically controlled.

Use ACTION Card, opposite page 64. Encircle No. 1

Production Broaches Made Standard Items

The du Mont Corp., Dept. BB, Greenfield, Mass., has announced the inclusion of production type high speed steel broaches as standard items in the company's line of keyway broaches. Ready for delivery are broaches for $\frac{1}{8}$ ", $\frac{3}{16}$ " and $\frac{1}{4}$ " keyway width and body diameters from $\frac{1}{2}$ " to 1" by $\frac{1}{16}$ " size increases.

They may be used with hydraulic or hand-operated arbor press. The back of



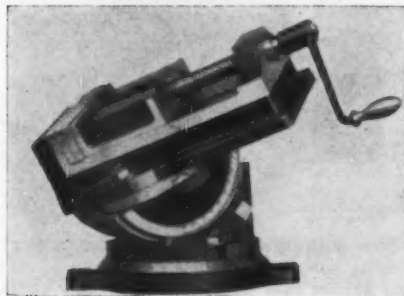
the broach is ground to fit the radius of the bore in which it will cut and the body of the broach thereby supports itself in the hole, requiring no guide or bushing.

Use ACTION Card, opposite page 64. Encircle No. 2

Vise performs varied tasks

The Master Multi-Swivel vise is claimed to meet the requirements of toolmakers and machine shops where a great variety of work is encountered, as in producing angular pieces and forms, dies for sheet metal stamping, and other irregularly shaped pieces. It is used also in determining and forming the edges for model parts of machines and work of a similar nature.

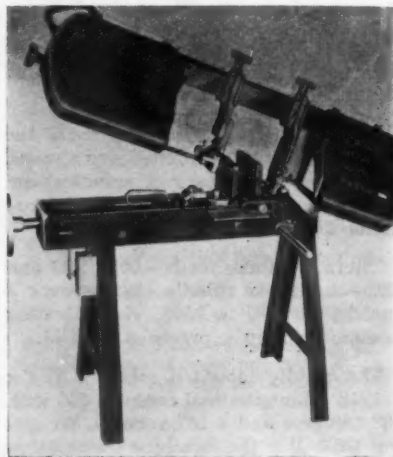
Vise can be set at any angle and work placed in position and removed without disturbing the setting. It can be moved easily from one machine to another and several operations performed without removing the piece. All parts are interchangeable, permitting the unit's use as a plain flanged vise, a



plain swivel vise and a multi-swivel vise.

Vise swings on a 360° swivel on the cradle which can be set to any angle to 90° in a vertical plane. Together these can be turned a full 360° on the base. Donovan Mfg. Co., Dept. BB, 80 Batterymarch St., Boston, Mass.

Use ACTION Card, opposite page 64. Encircle No. 3



Metal cutting band saw

A new metal cutting band saw, Model A, is being manufactured by W. F.

CUSHMAN chucks

give Chuck-ability

CHUCK-ABILITY — The ability to **SPEED** your work . . . **ELIMINATE** fatigue . . . **IMPROVE** your products . . . and **REDUCE** your costs . . . through design and selection of the right work-holding devices.



Typical Manually Operated Cushman Chuck-ability Chucks designed for Engine, Tool Room and Manufacturing lathes.

the key to machining efficiency

*If you don't hold it right, you can't machine it efficiently or economically . . . a positive truth for any chucking operation, whether it is the everyday simple routine job, or complex machining operations with many surfaces and close tolerances. Cushman Chucks give you **Chuck-ability** . . . the answer to efficient and economical machining of the new steels and alloys at high spindle speeds.*

Chuck-ability is available to you in Cushman's complete line of manually and air operated precision chucks, an invaluable combination of Cushman's exceptionally broad engineering experience plus know-how of the leading chucking specialists. Write today for catalogs fully describing Cushman Chucks. Consult us on all of your work-holding problems . . . standard or special.

THE CUSHMAN CHUCK COMPANY

Hartford 2, Connecticut
a world standard for precision

CUSHMAN CHUCKS . . .
a Product of American Quality,
Labor and Materials.



SEE YOUR INDUSTRIAL DISTRIBUTOR

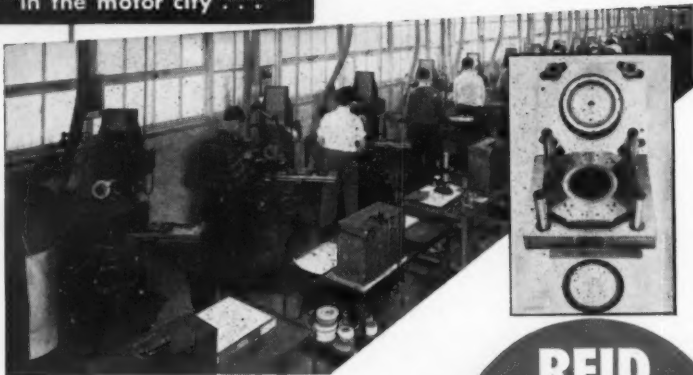
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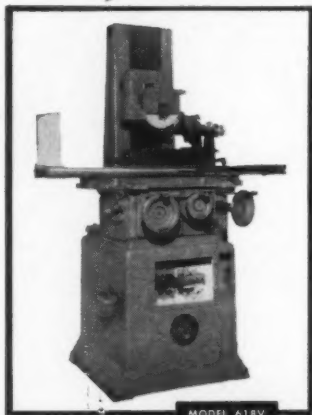
4C555B

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in the motor city . . .



REID
GRINDERS
set the
STANDARD
for
ACCURACY



MODEL 618V

In Detroit, at Commando Tool and Die Co., positive accuracy is a must in grinding the high-production tooling necessary for today's automobile and aircraft production race. Commando and many other shops in the area have found that Reid Surface Grinders provide the built-in accuracy that spells top performance year after year.

You, too, can have the precision, the better surface finishes, the dependability and convenience of operation that are engineered into every Reid Grinder. So why not plan now to replace the over-age surface grinders in your plant with new Reid Grinders.

Complete details are contained
in Brochure 618-6
— request your copy today.



Reid Brothers  **Company, Inc.**

BEVERLY, MASSACHUSETTS

Encircle No. 28 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



Remember...
A SHAVING CUTTER
IS NOT JUST
Another TOOL

EXPERIENCE

Making the successful rotary gear shaving cutter requires not only the consummate skill of the master toolmaker, but also a thorough knowledge of gear practice. The latter is acquired only the hard way, by experience — a lot of it.

No group anywhere has had as much cutter experience as Red Ring engineers who developed Rotary Gear Shaving. They have been learning more and more about cutters for the last 25 years — and still are.

DEVELOPMENT

It would be convenient indeed if all cutters could be made to a standard design, interpolating only for variations in basic gear characteristics.

Unfortunately, there are many variables which often make modifications essential. But, how much modification? Where to apply it? The answer again is **EXPERIENCE** with the performance data to substantiate it.

Service of this type provided by Red Ring engineers can make a valuable contribution to your gear processing operations.

Next time you buy shaving cutters be sure you are getting the maximum.

7204



SPIN AND MESH
SEAR SPECIALISTS
INNOVATORS OF ROTARY SHAVING
AND ELASTIC FORMING

NATIONAL BROACH & MACHINE CO.

3400 ST. JEAN DETROIT 15, MICHIGAN

WORLD'S LARGEST PRODUCER OF GEAR SHAVING EQUIPMENT

carbides?

IMPELLER HUB — 4" diam., 1 1/4" long, from SAE 1146 annealed steel forging. JOB ANALYSIS determined multiple-spindle chuckers with ALL CARBIDE tooling.

11 operations on first side, on 6" Acme-Gridley 8-spindle chucker with double indexing and duplicate tooling. 2 pieces per cycle in 22 1/2 seconds machine time — 320 pieces per hour.

17 operations on other side on single indexing 6" Acme-Gridley 8-spindle chucker. 26 seconds machine time — 138 pieces per hour.



high speed?

SEAL RING — 1/2" thick, from 2 1/2" diam. steel 6150 annealed. JOB ANALYSIS classed this as single-spindle job with HSS tooling.

5 shoulders rough and finish-formed to .002 tolerance, seat diam. held to .0005 tolerance, on 3 1/2" single-spindle Acme-Gridley bar-type turret lathe. 7 minutes machine time—8 (plus) pieces per hour. Spindle speed automatically changed 4 times during cycle to provide suitable speeds and feeds for required finish.



or BOTH



SHAFT — 7 3/4" long, from 1 1/2" diam. steel 6250 annealed. JOB ANALYSIS indicated single-spindle bar-type turret lathe, with part CARBIDE and part HSS tooling.

10 operations including deep forming, turning and form-turning on 3 1/2" single-spindle Acme-Gridley bar-type turret lathe: 5 minutes 46 seconds machine time — 9 (plus) pieces per hour.

5 automatic changes of spindle speed during the cycle provided speeds and feeds best suited for using both HSS and Carbide tools.

let the economies of the job dictate the right tooling method

(And the Right Machine)

All Acme-Gridleys are built with a rigidity factor to withstand the pressure of any cutting tool yet devised—at speeds as fast as modern cutting tools can "take it." With such a margin of power, speed and stamina built into each of National Acme's COMPLETE LINE of multiple- and single-spindle bar and chuck-type automatics, you can safely let the *economies* of the job dictate:

1. The best tooling method.
2. The machine best suited to produce the job most economically.

And you can be equally sure that tooling recommendations from National Acme will be based upon sound, experienced judgement.

If you would like a complete job analysis, we'd be glad to give you the benefit of our experience.

See us at the Machine Tool Show
Sept. 6 through 17. Booths 324 and 705

Encircle No. 2D on Card, Opposite Page 65

THE NATIONAL ACME COMPANY

177 East 131st Street, Cleveland 8, Ohio

OUR JOB: TO PROVIDE THE RIGHT MACHINE FOR YOUR JOB!

Wells & Sons, Dept. MTB, Three Rivers, Mich.

Saw has a capacity of 6" x 6"; features precision saw guides, adjustable cutting pressure, adjustable rate of descent for cutting tubing and for light work, quick action swivel vise, and welded angle iron legs.

Use ACTION Card, opposite page 64. Encircle No. 4

Heavy duty tumbling barrels

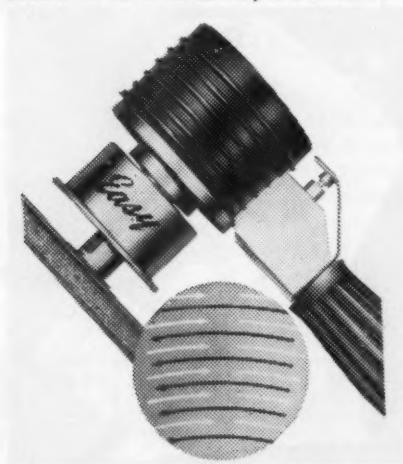
Esbec Series HD tumbling barrels have horizontal closed drums with total capacities ranging from 7½ to 45 cubic feet, which may be divided into two or more compartments. Barrels can be used for ball burnishing as well as abrasive tumbling. Overhead, variable speed drive keeps entire mechanism away from dampness and abrasive.

The locking mechanism is fast acting; its special design makes it impossible for the door to blow off in the operator's face if pressure has built up during run. Tumbling Sales & Service Co., Dept. BB, King St., Greenwich, Conn.

Use ACTION Card, opposite page 64. Encircle No. 5

Rougher and finisher in one sander

A new type of sanding machine, the Model D. A. dual action, has been an-



nounced by the Detroit Surfacing Machine Co., Dept. B, 1333 E. Eight Mile Rd., Detroit 20, Mich.

Sander is two units in one, each unit operating with a dual action. Sanding action moves in two directions at the same time, turning 6000 rpm's to the right, and at the same time moving in a fast reverse action to the left.

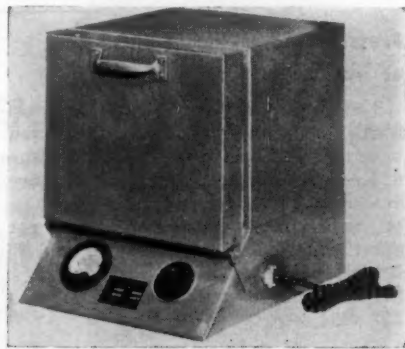
Results claimed are faster cutting and savings in abrasives. A simple device known as the shift ring instantly converts the unit to an off-center spinner. The off-center action is reported to reduce normal abrasive swirls to a minimum, enabling workmen to polish steel as well as nonferrous metals.

Sander is air-powered. The dual action counteracts torque, therefore is simple to use and easy on the operator, the manufacturer claims.

Use ACTION Card, opposite page 64. Encircle No. 20

Bench model electric furnace

The Cress C-100-6 is a bench model electric furnace designed for light industrial uses: small parts heat treating and lab testing.



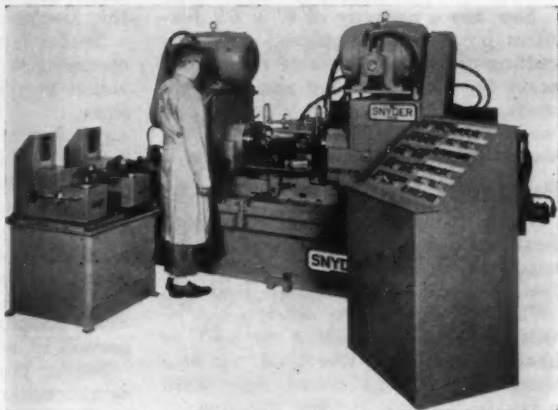
Temperatures may be controlled over a range of 300° F. to 2000° F. Dimensions are 8½"x10"x6½" interior; 13½"x17½"x16¼" exterior. Cress Electric Furnace Co., Dept. BB, 323 W. Maple Ave., Monrovia, Calif.

Use ACTION Card, opposite page 64. Encircle No. 21

Balancing Machine Handles Heavy-Duty Parts

A connecting rod precision balancing machine that handles a variety of heavy-duty and diesel engine connecting rods from 7 $\frac{3}{8}$ " to 12 $\frac{1}{2}$ " center distance has been announced by Snyder Tool & Eng. Co., Dept. B, 3400 East Lafayette Ave., Detroit 7, Mich. The machine is made up of three individual units: a milling machine having two opposed double-spindle heads, a console containing all operating controls and a precision weighing unit.

The production unit occupies a floor space of about 136 $\frac{3}{8}$ -in. wide by 121 $\frac{1}{4}$ -in. deep. It is about 7-ft. high. A 15 hp motor is provided on the machine illustrated for the crankshaft end of rod. A 7 $\frac{1}{2}$ hp motor drives the head for the piston end of the rod. The heads are



driven by a V belt and gear drive arrangement and have a 10 in. stroke. All head and fixture movements are hydraulically controlled. Maintenance for the electrical controls is simplified by utilizing packaged electronic units throughout.

Use ACTION Card, opposite page 64. Encircle No. 6

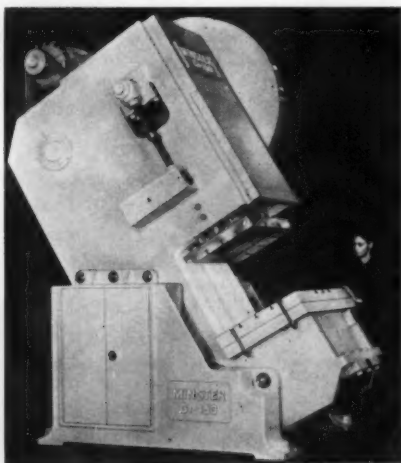
Press with steel frame fixed base or inclinable type

The G1-150 single point 150 ton steel frame gap press is built in either fixed base or inclinable type. Standard, centralized or cabinet leg controls are available. Standard stroke is 6 inches; standard speeds, 80 or 105 strokes per minute for the flywheel presses and 30 strokes per minute for geared presses. Bed area is 30" x 50" and slide area 24" x 34".

Inclinable type can be inclined from vertical to 30° in approximately three minutes. The fixed base single geared press uses a clutch in gear arrangement with all gears totally enclosed running in oil.

Massiveness of steel frame sections in-

creases compressive strength and builds



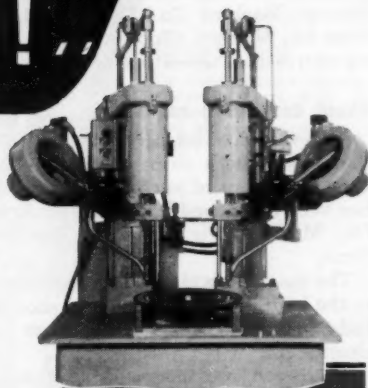
Dependability!
Precision!
Speed!

Three Important
 Production Factors
 Presented by the

DPS LINE OF
 ASSEMBLING EQUIPMENT

● Do you have a feeding or assembly problem? Remember that DPS stands for equipment that will bring you greater earnings, lower costs and on-time schedules . . . A complete line of modern power-driven machines that assures performance in keeping with the increased tempo of present-day production.

Give Us Your Problem—Send Sample Assembly—
 NO OBLIGATION!



POWER
 SCREWDRIVING
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•
 SELECTIVE
 PARTS FEEDERS

•
 SPECIAL
 ASSEMBLY
 MACHINES

DETROIT POWER SCREWDRIVER CO.

2809 W. FORT ST.

DETROIT 16, MICH.

up vibration dampening qualities. Bearing housings are supported from all angles to provide maximum support for crankshaft under capacity load. Slides have box type cast construction to eliminate way deflection. Ways are exceptionally long and bronze lined.

Combination air friction clutch and brake is mounted on crankshaft in either flywheel or main gear to provide controlled single or multiple cycling within a wide range of speed; narrow width on shaft without sacrificing friction surface; constant torque output at given air pressure or variable in direct proportion to applied air pressure. The Minster Machine Co., Dept. MTB, 250 West St., Minster, Ohio.

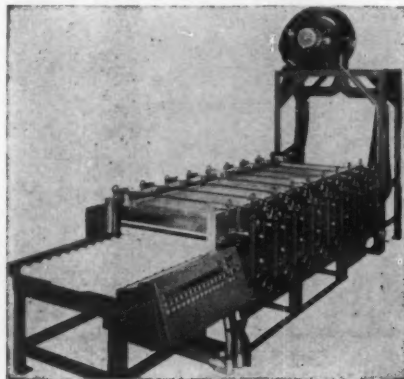
Use ACTION Card, opposite page 64. Encircle No. 7

Sheet scrubbing machine

A new industrial scrubbing machine that cleans both sides of metal sheets from all traces of surface dirt and oils has been developed by the Fuller Brush Co., Machine Div., Dept. B, Hartford, Conn.

The machine is claimed to clean plates to the high degree necessary to successfully pass the water break test for cleanliness.

There are two models, a long and a short. The longer machine removes heavier accumulations of surface dirt.



Either machine processes sheets at the rate of 60 feet a minute. A detergent and water solution is pumped onto the plates when they enter the machine. They are then scrubbed with nylon cylindrical brushes, and rinsed and dried as they come out.

Use ACTION Card, opposite page 64. Encircle No. 8

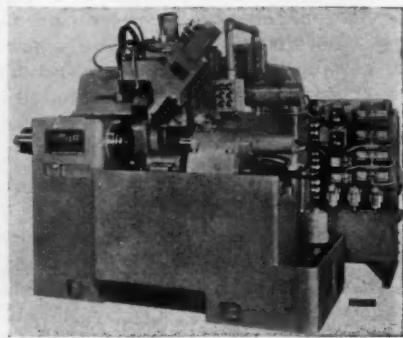
Copying lathe combines versatility with high production

The HD-8 tracer lathe reportedly permits the turning of complex shapes while reducing the chance for human error, and also has the rigidity and power to take sizeable cuts, thus reducing machining time.

Location of the tracer slide on the top carriage is said to lessen the possibility of chips, dirt, etc., getting onto the slide and interfering with efficient operation. The unobstructed front of the machine, permits easy loading, unloading and checking of work.

Machines can be supplied with either a constant or variable speed drive for the spindle. Also available is an auxiliary rear carriage for facing, grooving, chamfering or any other type of cut that can be handled by a straight plunge operation.

Either flat or round templates can be used and template can be made of relatively soft material since the light pressure of the stylus results in no appre-

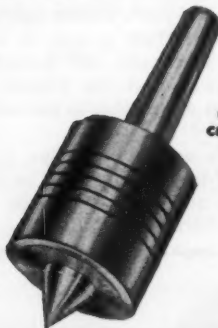


There's an **IDEAL**
LIVE CENTER
 to do YOUR job best!

STANDARD MODELS IN A COMPLETE
 LINE DELIVERED FROM
 DISTRIBUTORS STOCKS!

When you choose IDEAL Live Centers you seldom have to resort to "specials" and the slow delivery and inventory problems they involve. You can handle practically any turning job with a *standard* IDEAL Live Center.

Top performance is also "standard" with IDEAL Live Centers. They have proven their accuracy and long life in tough service in shops all over the country where they are first choice! When you need a live center, you'll get the one you want, when you want it, easiest, from the complete IDEAL Line, stocked by your IDEAL Distributor.



UNIVERSAL

Accuracy to plus or minus .0001". Unusually high load capacity up to 5200 lbs. at 50 RPM. Morse tapers 2, 3, 4 and 5.*

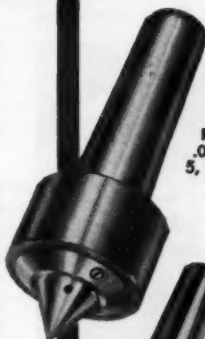
***IDEAL LIVE CENTERS ARE ALSO AVAILABLE IN BROWN & SHARPE AND JARNO TAPERS**

Sold through Leading Distributors
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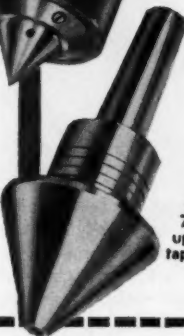
MULTI-DUTY

Interchangeable male, female and pipe points for centered and un-centered work. Nine sizes: Morse tapers 1 through 5, as well as straight.* Loads to 1500 lbs. at 100 RPM.



HEAVY DUTY

For close tolerance turning jobs to 22,000 lbs. at 50 RPM. Eccentricity less than .0002". Morse tapers 4, 5, 6 and 7.*



**NEW
 PIPE POINT
 LIVE CENTER**

For heavy turning work on pipes and other large, hollow cylinders. Sizes range from 3" diam. to 7 1/2" diam. Load capacities up to 22,000 lbs. Morse tapers 3, 4, 5, 6 and 7.*

IDEAL INDUSTRIES, Inc.
 1441 Park Avenue, Sycamore, Illinois

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COMPANY.....

ADDRESS.....

CITY.....ZONE.....STATE.....



Encircle No. 321 on Card, Opposite Page 65

ciable wear. Hydra-Feed Machine Tool Corp., Dept. B, 730 W. Eight Mile Rd., Ferndale, Mich.

Use ACTION Card, opposite page 64. Encircle No. 9

Deep throat contour saw

A new low price contour saw with a 30 inches throat has been announced by the DoAll Co., Dept. B, 254 N. Laurel Ave., Des Plaines, Ill.

Through the addition of simple and inexpensive accessories the machine is claimed to perform band filing at rapid rates, metal polishing, finishing and slicing. Even carbide tools can reportedly be finish ground on these machines.

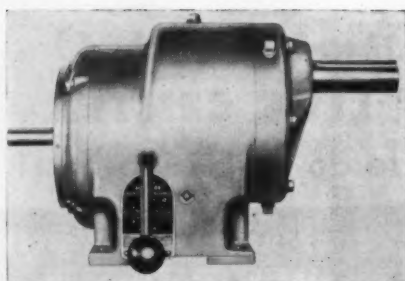


A heavy trunnion and cradle support the 24" x 24" work table giving the rigidity needed for handling heavy or large pieces. Table tilts 45° to right and 10° to left. Saw blade welder handles up to ½ width for welding an annealing.

Use ACTION Card, opposite page 64. Encircle No. 10

Gearshift drive

The Lima Type R3DC sliding gear transmission is built with a capacity of 5 hp at 1800 rpm input and provides four constant horsepower output speeds when used with a single speed motor; eight output speeds are developed when used with a 2 speed motor.



Primary gear ratios are 4.15 to 1, 3.15 to 1, 1.85 to 1 and 1 to 1. Eleven optional secondary gear ratios are available, ranging to a maximum of 2.25 to 1. The Lima Electric Motor Co., 119 Findlay Rd., Lima, O.

Use ACTION Card, opposite page 64. Encircle No. 11

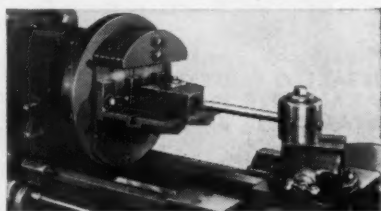
Precision lathe fixture

The universal precision lathe fixture provides a means of locating and holding non-round work and odd shapes for machining on engine lathes, turret lathes, grinders and boremetrics.

The fixture is equipped with a precision centerline locating pin from which accurate vertical locations can be made. It is provided with adjustable counterweights to insure proper balance in operation. The fixture mounts on any standard lathe face plate and a center back plug insures that the fixture is properly located in relation to the lathe centerline.

The fixture is available in five sizes to fit lathes of 9" capacity and larger. Universal Vise and Tool Co., Dept. B, Hitchcock St., Parma, Mich.

Use ACTION Card, opposite page 64. Encircle No. 12



Sets screws 83% faster

ROTOR RIGHT ANGLE NUTSETTER

speeds assembly of radio chassis

JOB: Driving #8 hex head self-tapping screws for assembly of radio chassis.

FORMERLY: Electric Nutsetter, operating at 1750 rpm. Too slow.

NOW: Rotor S-02LRA Right Angle Reversible Air Nutsetter operates at 3200 rpm, gives faster run down, handles easier.

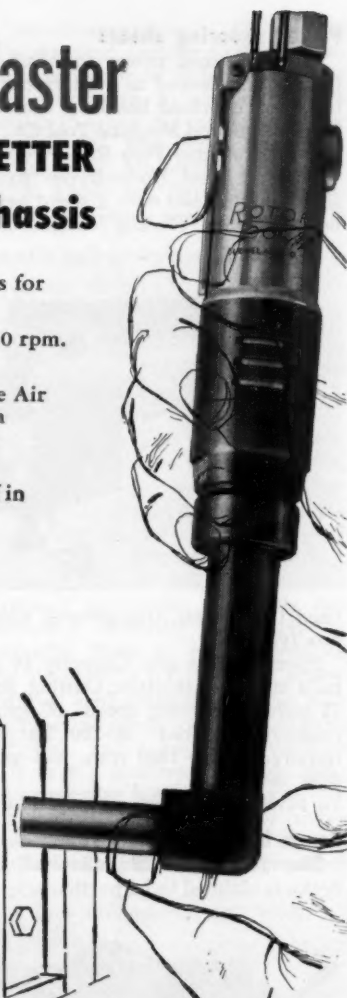
RESULTS: 83% saving in time. Used 60% of production time, "02" Nutsetter paid for itself in about 4 weeks.

This Rotor Nutsetter lasts longer, performs better than other midget right angle tools because of an all-steel right angle head with replaceable bevel gears running in ball and needle bearings. Ask for a demonstration of "02" Series Nutsetters and Screw Drivers.

Rotor makes a complete line of portable tools



SPECIFICATIONS						
Model	Free R.P.M.	Capacity		Weight (lbs.)	Lgth.	Drive
		Nuts	Screws			
S-02LRA (Reversible)	3200	To 1/4"	To #12	2 1/4	10 1/2	1/4" Sq.
	1600					3/8" Sq.
	680 360	3/8"	3/8"	2 1/4	11 1/4	3/8" Sq. 1/4" Female Threaded



THE **ROTOR TOOL** CO.

CLEVELAND, OHIO

HIGH CYCLE

Power squaring shears

A re-designed power squaring shear that is engineered to stall rather than break on overload has been announced by the Diamond Machine Tool Co., Dept. B, 5111 Coffman-Pico Rd., Pico, Cal.

This all steel underdriven squaring shear is equipped with a silent herringbone gearing, electric clutch, centra-



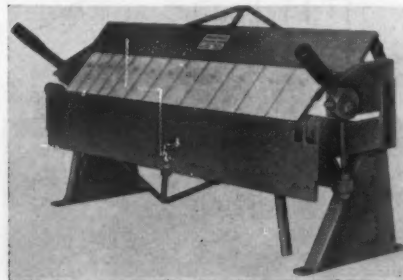
lized lubrication, triangulated ram and box type bed.

Specifications are: Capacity 10 gauge mild steel or stainless; Cutting length-73 inches; Shearing speed- 80 spm; Air pressure required- 60-200 lbs; Motor required- 5 hp 1800 rpm; Net weight-4800 lbs.

Use ACTION Card, opposite page 64. Encls No. 13

Bench brake for short runs

The Model U322 universal bench brake is claimed to be particularly fitted to short run production and experi-



mental work as well as plain or box and pan jobs that would tie up larger equipment. The machine is portable for on-the-job setup.

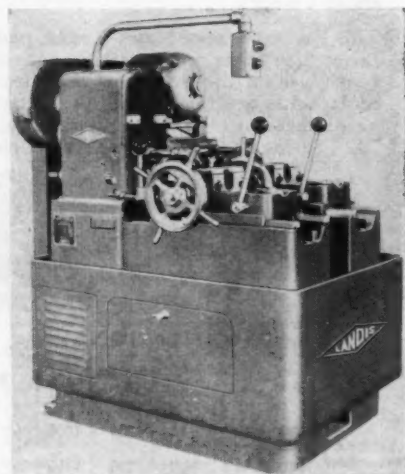
Rated capacity is a 3/4 flange on 22 gauge mild steel, full 3' length. Fingers of case hardened steel in widths of 2, 3 and 4 inches allow box depths to three inches. W. Whitney Stueck, Inc., 1 Connecticut Ave., Dept. B, Old Saybrook, Conn.

Use ACTION Card, opposite page 64. Encls No. 14

Machine for pipe and nipple threading

A double spindle Landmaco machine has been designed for the production threading of pipe and nipples from 1/8" to 3/4" in diameter.

The tangential chaser threading heads furnished with the machine are equipped



with reamer attachments to enable the threading, reaming and chamfering operations to be performed simultaneously. These die heads also feature an internal trip mechanism to provide constant thread length regardless of normal differences in the nipple length or in the gripping position.

The five spindle speeds range from 133

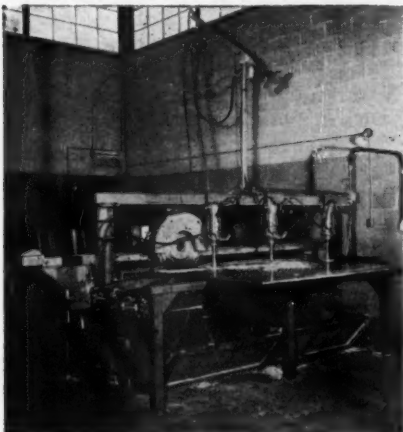
to 310 rpm. Each of the five pipe diameters within the range of the machine can be threaded at the most efficient speeds.

The carriages are operated by levers and provide a 6" travel. A hammer blow handwheel, which intensifies gripping power without operator fatigue, is used to operate the carriage vise. The entire vise is adjustable, both horizontally and vertically. Landis Machine Co., Dept. B, 36 E. 6th St., Waynesboro, Pa.

Use ACTION Card, opposite page 64. Encircle No. 15

Saw features automatically adjusting air cylinders

The Meiermatic saw is claimed to reduce cutting time and setup time



on nonferrous plates. Automatically adjusting air cylinders provide uniform clamping pressure adjusting up to 5" thick. Multiple mechanical clamping devices are thus eliminated. By virtue of the positive clamping from the overhead beam, floor space is at a minimum, 55"—110".

Aluminum plate up to 5" thick and up to 9' 6" long in any width may be sawed. Maximum thickness of other materials is dependent upon their machinability. Time for cutting a 96" length of 1"

thick aluminum plate is 43 seconds using a circular, carbide tipped blade. The cutting motor is 10 hp geared-in-head induction type. Arbor speed is 2150 rpm with a 1" arbor and maximum blade diameter of 22". Meiermatic Saw Div., Meier Brass & Aluminum Co., Dept. B, 1471 E. 9 Mile Rd., Hazel Park, Mich.

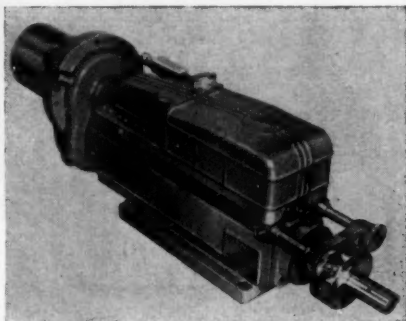
Use ACTION Card, opposite page 64. Encircle No. 16

Automatic self-contained drill units powered by oil or air

An automatic, self-contained drill unit, the Air-O-Matic, has been announced by the Morris Machine Tool Co., Dept. B, Harriet St., Cincinnati 3, Ohio.

Actually, there are two units. Although most parts are interchangeable, one unit is powered by oil, the other by air. Both are hydraulically controlled. Designed for a wide range of drilling, tapping, reaming, chamfering, spot facing, hollow milling, centering and related operations, the units can be mounted vertically, angularly or horizontally. Feed in both directions can be attained by turning a set screw.

Features: a 6" maximum stroke with feed stroke infinitely variable between 0 and 4½"; rapid approach variable from 0 to 6"; positive stop for spot-facing or counter boring repeats within .0005"; instantaneous return or delay between feed stroke and rapid return; multiple feeds and rapid approaches



easily obtained with special feed dogs.

The hydraulic system used for control on the air-operated unit is a sealed system, permitting fine adjustment of feed rate. A built-in reservoir automatically compensates for leakage, if any.

In the all-hydraulic unit, where oil is used for both power and control, a single reservoir supplies oil for both purposes. This unit has two integral pistons on the drill quill and the design eliminates oil pressure on the cylinder end caps.

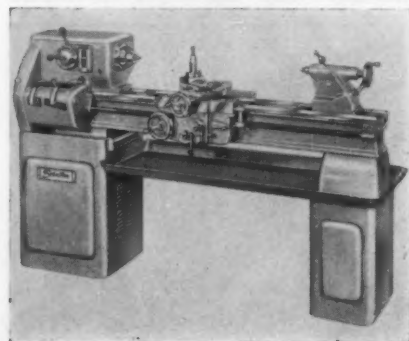
Three methods of spindle drive are provided. Gear, pulley or a combination of the two may be used to give spindle speeds ranging from 266 to 5000 rpm. The spindle drive is separate and distinct from the feed; either may be varied independent of the other.

Specifications: 33 $\frac{1}{4}$ " long, 11" wide and 23" high; 2 HP, approximately 650 pounds of thrust, permitting a maximum drill size of $\frac{5}{8}$ ". Maximum stroke is 6"; feed stroke variable from 0 to 4 $\frac{1}{2}$ "; the range of feed rate is from 0 to 48" per minute; quick approach rate from 174 to 300" per minute and quick return rate from 174 to 488" per minute.

Use ACTION Card, opposite page 64. Encircle No. 17

Fifteen inch geared head lathe

This lathe features a wide, heavy bed, anti-friction bearing headstock with tapered roller bearings supporting



the spindle, cam action tailstock clamp and an easy shifting spindle speed dial.

All gears in the headstock run in oil. Gear box is large and has 60 different pitches and feeds. The lead screw reverse lever is built into the gear box and permits the operator to change the direction of the lead screw while the lathe is running.

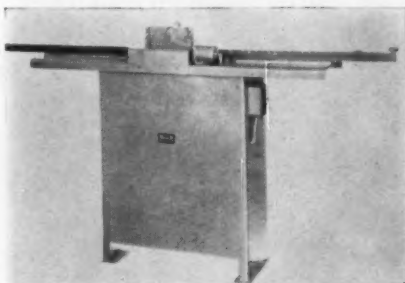
A cam action tailstock clamp reportedly permits quick release and instant locking of the tailstock. Lathe also has a built-in one shot oiling system. Sheldon Machine Co., Inc., Dept. B, 4258 N. Knox Ave., Chicago 41, Ill.

Use ACTION Card, opposite page 64. Encircle No. 18

Automatic stile boring machine aids fabrication of movable shutters

A completely automatic stile boring machine bores a series of holes on precise centers in the stiles of movable shutters to receive the tenoned slates.

Operator merely loads the stock with



the aid of a cam clamp and pushes the start button. The machine does the rest, indexing the stock and drilling holes as fast as 120 holes per minute. It shuts itself off after the last hole is drilled.

Features: positive-locking index mechanism; 25,000 rpm spindle speed, and plug-in assemblies for easy maintenance. Century Tool & Engineering Co., Dept. BB, 6336 Slauson Ave., Culver City, Calif.

Use ACTION Card, opposite page 64. Encircle No. 19

Automatic indexing tool post turret

All parts of the Westwood 4-position automatic indexing tool post turret are of alloy or tool steel, heat treated and ground to close working tolerances. No pin plungers are used. Indexing is accomplished through a rectangular steel bolt which slides longitudinally in a closely fitted groove and is automatically pressure loaded at each indexing. One movement of the ball handled lever forward and back unlocks the turret, indexes to the next tool position and relocks for the cut.

This turret is designed to make economical use of standard $\frac{1}{2}$ " square high speed steel or carbide tool bits. No holders are required. Smaller tool bits, down to $\frac{5}{16}$ " square, may be used for lighter cuts, if desired, by placing suitable riser pieces under the tool bit to raise it to the proper cutting height. Available for 12", 14" and 16" machines. Westwood Engineering Co.,



Dept. BB, 2234 Purdue Ave., Los Angeles 64, Calif.

Use ACTION Card, opposite page 64. Encircle No. 38

USE THE CAPACITY FOR WHICH YOUR MACHINE IS DESIGNED

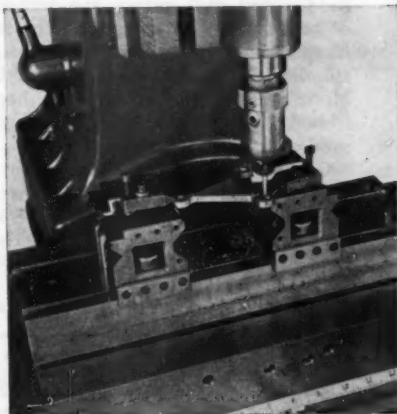
A Solution to Your Work-Holding Problems

• THE HANSON HOLDING FIXTURE is adaptable to Jig Bore, Jig Grinders, Vertical Mills, Duplicators etc. This fixture is permanently square and in-line with the ways of the machine. Therefore, its accuracy is unsurpassed in its application to Work Holding.

It need not be removed. To accommodate various jobs, simply loosen the Sliding Blocks and re-space to the size required. Due to the precision, the Sliding Blocks are instantly re-located at any time.

It effects great savings in set up time as the Work Piece is aligned by the fixture, thereby eliminating the otherwise necessary indicating for squareness. Duplicate Pieces can be machined with the same accuracy as the original without duplicating the set-up time.

THE HANSON HOLDING FIXTURE eliminates distortion of the Work Piece due to its unique method of holding.



HANSON & COMPANY

6527 RUSSELL ST.

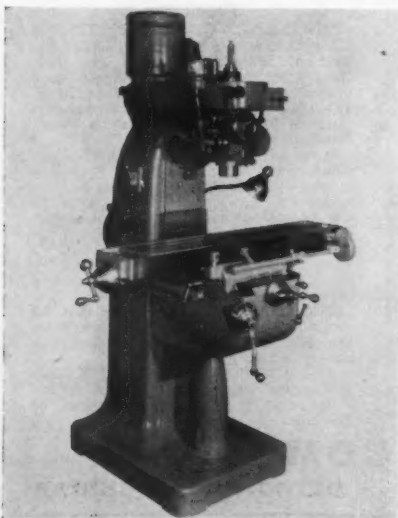
DETROIT 11, MICHIGAN



A barrel handling truck, Model 600, which requires no tipping or pick-up space when handling barrels touching each other, is equipped with an automatic spring actuated bar that allows a hook to slip over the barrel edge without the operator touching either hook or barrel. Valley Craft Products, Inc., Dept. BB, 760 Jefferson Ave., Lake City, Minn.

Improved vertical mill

The Index improved Super 55 vertical milling machine, for boring, milling and drilling operations, offers a 1½ or optional 2 hp head with heavy-duty motor affording 50% more capacity than



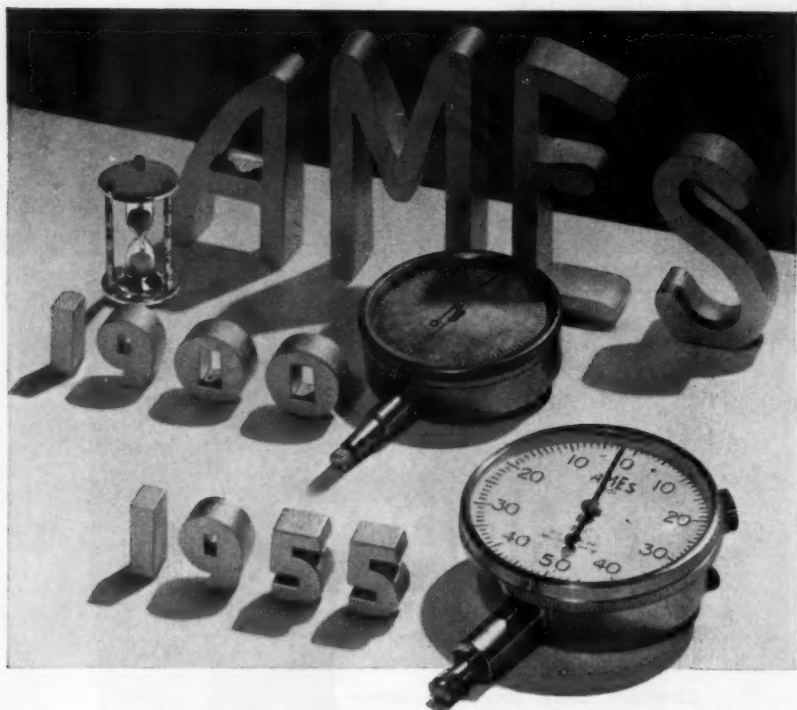
previously available, due to the increased horsepower and dynamically balanced cast iron pulleys and drive system.

An improved system of table gibs allows the table clamping mechanism to be brought to the front side of the saddle and still retain the advantage of having the rod trays adjacent to the fixed table slideway. Newly designed spindle brake increases productivity. More weight in the column, heavier ribbed column, heavier knee and heavier saddle are additional features.

Capacity, ¾" to 1½" end mills in tool steel, 2" or more in milder steels or cast iron. Table size 40" x 9" or 46" x 9". Heavy-duty silent V-Belt drive. Height over-all 76". Index Machine Co., 543 N. Mechanic St., Jackson, Mich.

Use ACTION Card, opposite page 64. Encircle No. 43

Will You Be There?
National Machine Tool Show,
Production Engineering Show,
Coliseum Machinery Show —
Chicago, Sept. 6-17, 1955. We'll
be looking for you!



... the preferred dial indicators

TIME-TESTED FOR ACCURACY AND DEPENDABLE PERFORMANCE!

For more than half a century, industry has relied on Ames indicators for help in the solution of measurement problems of all kinds. And through the years, Ames indicators have done their jobs superlatively well. The Ames reputation for extreme accuracy, ruggedness and reliability through many millions of cycles is due to an unswerving dedication to our original guiding principle—to make the best possible indicators and gauges, through constant research and the use of highest quality materials and expert craftsmanship.

We will gladly make recommendations on your measurement problems. Please send blueprints and specifications. And ask for your free copy of the Ames catalog.

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B.C. AMES CO.

28 Ames Street, Waltham 54, Mass.

MANUFACTURER OF MICROMETER DIAL GAUGES • MICROMETER DIAL INDICATORS

Encircle No. 324 on Card, Opposite Page 65

July, 1955

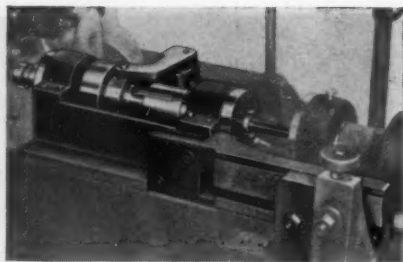
195

Sliding head automatic lathe

A new sliding head automatic lathe, the Howard D-187, built domestically to American standards, is said to mass produce parts up to 3/16" dia., 2 3/4" long.

Using the same machine base, power units and tooling employed on the 1/2"-capacity Howard D-500, extremely high finish is achieved by spindle speeds up to 15,000 RPM, under pressure lubrication.

Extreme tolerances are reportedly



over **8,000** Different Selections
For Immediate Delivery!



Quality-Famous, Heavy Duty
AIR AND HYDRAULIC

CYLINDERS

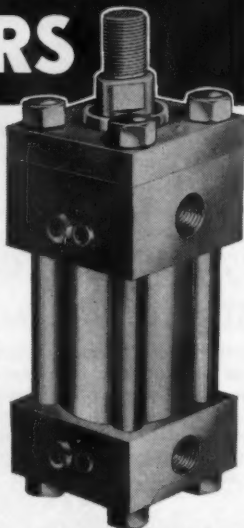
now "in stock" for
immediate shipment to you
in popular sizes, mountings

Eliminate costly production delays—speed-up your design and replacement programs—with this greatest quality selection ever offered on such fast delivery service.

AIR CYLINDERS, 200 psi, 1 1/2" through 8" bores, strokes up through 36", over 15 popular mountings, cushioned and non-cushioned.

HYDRAULIC CYLINDERS, 2000 psi, 1 1/2" through 5" bores, strokes up through 36", over 15 popular mountings, cushioned and non-cushioned.

Larger bores (up through 20" air, 12" hydraulic) and longer strokes (up to 22 feet) available on longer delivery.



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MILLER FLUID POWER COMPANY
(Formerly Miller Motor Co.)

2026 N. Hawthorne Ave., Melrose Park, Ill.

CYLINDERS • BOOSTERS • ACCUMULATORS
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• The new R and L TOOLS CATALOG will make interesting, profitable reading to every good machinist. Interesting, because it contains a wealth of information about these "masterpieces of the toolmaker's art". Profitable, because it tells you how you can get all the precision and time-saving qualities built into every R and L TOOL.

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1825 BRISTOL STREET - PHILADELPHIA 40, PA.

TURNING TOOL - CARBIDE OR ROLLER BACKRESTS - RELEASING OR NON-RELEASING TAP AND DIE HOLDERS, (ALSO FURNISHED FOR ACORN DIES) - UNIVERSAL TOOL POST - CUT-OFF BLADE HOLDER - RECESSING TOOL - REVOLVING STOCK STOP - FLOATING DRILL HOLDER - KNURLING TOOL

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1825 BRISTOL ST.
PHILADELPHIA 40, PA.

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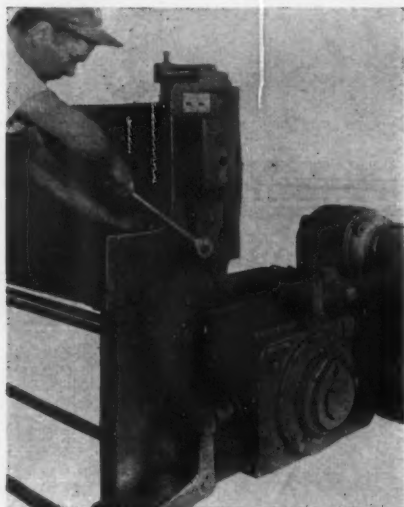
H-1

held by new, highly sensitive sliding head with independent pulley carrier bracket which eliminates deflection of the spindle and slide. Howard Automatic Div., Detroit Cam & Tool Co., Dept. B, 2305 Goodrich Ave., Ferndale, Detroit 20, Mich.

Use ACTION Card, opposite page 64. Encircle No. 23

Drive unit redesigned

A redesigned drive unit for all power squaring shears in their line has been announced by Wysong and Miles Co., Dept. BB, 652 Fulton St., Greensboro, N.C.



Unit is fully enclosed and runs in oil. The new design eliminates a long pinion shaft. Another improved feature is the placing of the bed-belts on the outside of the end frames for easier blade setting.

Use ACTION Card, opposite page 64. Encircle No. 24

New series added to press brake line

Service Machine Co., Inc., 204 Miller St., Dept. B, Elizabeth, N.J., has announced its 55 Series press brakes—Models 55-609 with 6 foot bed, bending capacity 9 ga.; 55-811 with 8 foot bed,



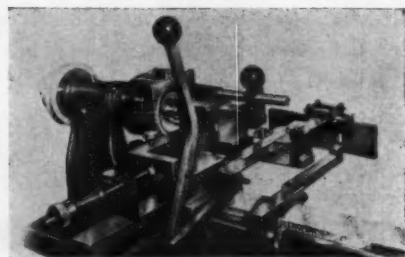
bending capacity 11 ga.; 55-1012 with 10 foot bed, bending capacity 12 ga.

Specifications: 5 hp motor, 3" stroke, 5" ram adjustment, 9½" depth of throat, 14" shut height.

Use ACTION Card, opposite page 64. Encircle No. 25

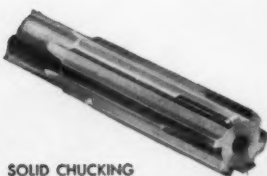
Centerless profile tracer

The Turnomat centerless profile tracer lathe attachment can be attached to either wood or engine lathes; performs centerless turning, precision duplicate turning, facing, fluting and reed-




ing operations on wood, plastic, aluminum, steel and brass. It is particularly adaptable for short run production. Turnomat Co., Inc., Dept. MD, Brockport 56, N.Y.


Use ACTION Card, opposite page 64. Encircle No. 26



SOLID CHUCKING
REAMERS




EXPANSION REAMERS



SHELL-TYPE
EXPANSION REAMERS



CORE DRILLS



STUB SCREW MACHINE
REAMERS (SOLID AND
EXPANSION TYPES)



SHELL END MILLS



END MILLS



COUNTERBORES,
SPOTFACERS

Write for the Staples
Standard Tool Catalog

each a specialist
in cost cutting

Staples

CARBIDE-TIPPED CIRCULAR TOOLS

Your economy begins — and work quality improves—when you specify Staples carbide-tipped circular tools. They have established an enviable reputation throughout industry for delivering top-profit performance on every job.

A complete range of standard tool designs and sizes is available for quick delivery from stock. For your special tools, submit your specifications and prints for a prompt quotation. You'll be making the most of your standard and special tool investment when you put Staples Tools to work in your production.

Staples

CARBIDE-TIPPED CUTTING TOOLS

A complete line of Circular Carbide-Tipped Tools, Expansion Reamers — Special Tools

THE STAPLES TOOL COMPANY, CINCINNATI 25, OHIO

Encircle No. 327 on Card, Opposite Page 65

July, 1955

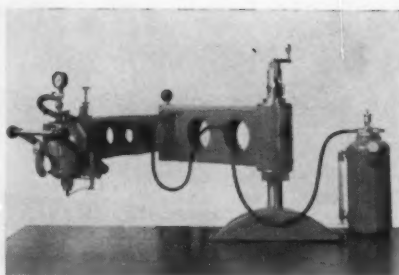
199

Radial arm bench router

Typical applications for the model W-106A radial arm bench router include edge trimming and cutout operations on plywood, plastic and aluminum alloy sheets.

Maximum reach of the arm is to any point on a table in a radius of 44 inches from center of column. Motor capacities: 1 hp, 22,000 rpm; $\frac{3}{4}$ hp, 30,000 rpm. Onsrud Machine Works, Inc., Dept. B, 3900 W. Palmer St., Chicago, Ill.

Use ACTION Card, opposite page 64. Encircle No. 27



Need a really accurate collet chuck?
Before you buy **COMPARE** the new
HANCOCK Ball-Bearing **CHUKOLLET**
with any collet holder.

COMPARE for accuracy!
COMPARE for versatility!
COMPARE for gripping power!
COMPARE set-up time!
COMPARE price!



Pat.
Pend.

No collet chuck is as versatile, can grip as tightly or as accurately as the new Chukollet. Can be used on any machine in the shop.

No other collet chuck has an adjustable stop for positive axial location to .0005 inch! 5C collet is not drawn in while closing.

See for yourself. Make a test in your own shop next time you have a job that demands the ultimate in axial and radial accuracy. Remember, Chukollet is guaranteed. Money refunded in 30 days if not completely satisfied! Send for literature today.

Manufacturers'
agents and dealers,
several territories
available.

HANCOCK MFG. CO.
Santa Clara, Calif.

It's New... It's Different

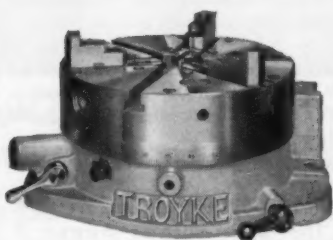
TROYKE ROTO-INDEXER

(Patented)

Takes the place of Expensive Jigs and Fixtures in Connection with Milling, Drilling, Jig Boring, Grinding and Slotting.

INDEXING

Rapid • Positive • Accurate



MODEL AC-12

12" Roto-Indexer with Special 12" Diameter Steel Body Chuck.

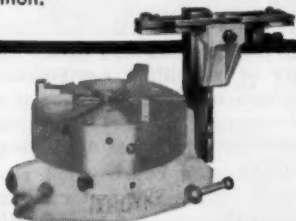


MODEL AH-12"-15"

Roto-Indexer with T-Slotted Turntable

Features: Unique Patented Block-out Arrangement. • Hardened and ground twenty-four station index plate—any or all stations can be blocked out with use of screw driver only. • Hardened and ground plunger. • Rigid Locking (Adjustable). • Center bearing adjustable for wear. • Two oil grooved bearing surfaces for rigid support of the table. • Graduated in Degrees. • Can be used in vertical or horizontal position.

Two Models of Drilling Attachments Available on all models.



The Roto-Indexer is a Quality Product at a Low Price

TROYKE MFG. CO., CINCINNATI 9, OHIO

4420 Appleton Street

Ask for complete Catalog No. 20 Giving Full Details

Hydraulic lift table

A new type hydraulic lift table has a 2000 lb capacity with a 3000 lb hydraulic unit capacity. Table is 29" long x 19" wide and has a rise from 30" low to 43" high.



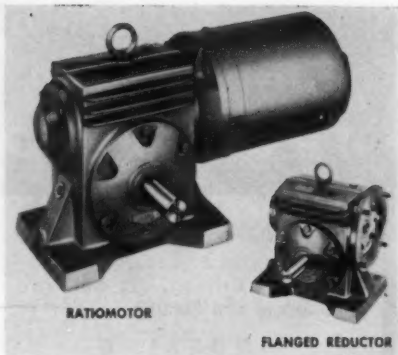
The unit can be used for a positioning table for welding or an adjustable work bench for many operations. It is useful to transport heavy dies and castings to presses or milling machines and then raise them to desired height. W. J. McElmoyl Co., Dept. B, Groveville, N.J. Use ACTION Card, opposite page 64. Encircle No. 28

Motorized speed reduction units

New 100 series Ratiomotors are standard stock motorized gear reduction units of simplified combination construction which are claimed to provide maintenance savings and adaptability to an extended range of applications.

Combination construction reportedly permits removal of motor at any time without disturbing gear reduction unit. Ratiomotor gear units are available without motor as flanged reducers, permitting customer to buy and install standard end-mounted motors of his own choice.

They are available in 28 standard stock models—194 different motorized



units, with general-purpose or totally-enclosed motors in 13 different sizes from 1/6 to 10 hp, with various voltages.

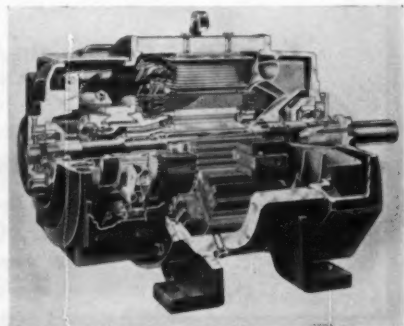
Flanged reducers (Ratiomotor gear units less motors) are available in the same range, with ratios from 10:1 to 3600:1, and output torque ratings from 50 in. lbs. to 9400 in. lbs. Boston Gear Works, 81 Hayward St., Quincy 71, Mass.

Use ACTION Card, opposite page 64. Encircle No. 29

Motors feature quick response

The direct-current Super T line motors developed by the Reliance Electric and Engineering Co., Dept. B, 1088 Ivanhoe Rd., Cleveland 10, Ohio, produce fast, accurate response, as exemplified in the following case history:

A special 250 hp drive in a steel mill operates a flying shear which cuts bar





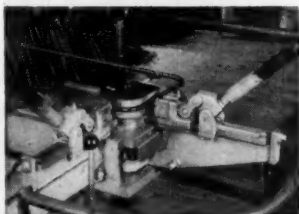
Pines Series 1400 production bender installation at Quaker Stretcher Company, Kenosha, Wis.

HOW SMALL PINES Hydraulic BENDERS SPEED OUTPUT of TV SERVETTE TRAYS

At Quaker Stretcher Co., Kenosha, Wis., four Pines Series 1400 Benders are producing high quality bends for TV servette tray legs at unusually low cost. Two smooth, 90° bends on a 2" CLR are formed in 5/8" x .018" wall, roller-coated, lock-seam tubing *without marring the black enamel finish*. The machines, costing under \$2000.00 each, are operated by women. High efficiency is maintained. *Net production per machine averages 432 bends per hour*, and the only scrap loss is a very few pieces while making setups. Pines Series 1400 Benders feature small capital investment, fast, easy operation, and uniform results. Hydraulic actuation assures dependable accuracy, low operating cost.

PINES ENGINEERING CO., INC.
Specialists in Tube Fabricating Machinery 690 WALNUT • AURORA, ILLINOIS

PRODUCTION BENDING • DEBURRING • CHAMFERING MACHINERY



Closeup showing easy-operating manual toggles, simple tooling. Plug mandrel, Ampco bronze wiper die produce smooth, mar-free bends in pre-coated stock.

Free DATA SHEETS



Write for free copies of "Pines News" illustrating latest cost-cutting bending techniques. Or, call on Pines Engineers for assistance on any job.

stock traveling at 2200 fpm into 81-foot lengths within $\frac{1}{2}$ " accuracy. For each cut, the motor is accelerated to a precise speed, stopped, and repositioned in 1.7 seconds. Once requiring a highly-specialized design, this job now can be done with a standard Super T motor.

Other features claimed for the motor are: ruggedness, ability to take full load and overloads, ability to change speed rapidly, ability to maintain torque and tension, and to reverse and stop quickly. Motor sizes at present range from 20 to 100 hp.

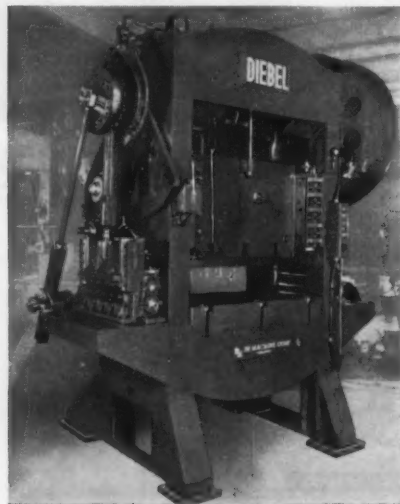
Use ACTION Card, opposite page 64. Encircle No. 30

One hundred ton automatic press

A new 100 ton double crank welded steel press has been developed by Di Machine Corp., Dept. B, 2701 W. Irving Park Rd., Chicago 18, Ill.

This press is built with 40", 50" and 60" between uprights and 32" front to back. Speed range is from 80 to 240 strokes per minute.

A cylindrical type ram is claimed to assure accurate alignment. Air clamped



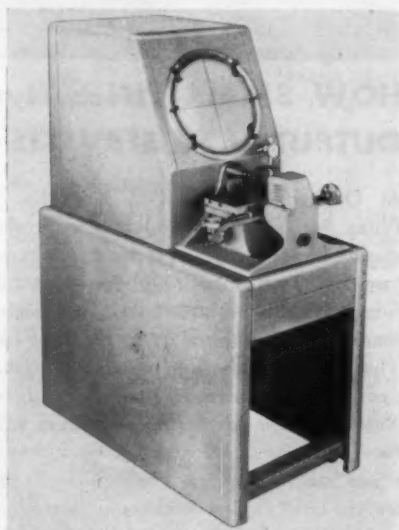
feeds prevent stock distortion and permit positive feeding. Press is available with single or double feeds and scrap-cutter. Standard equipment includes a balanced crankshaft, air counter-balances, automatic metered lubrication system, wired electrical control system, air clutch and specially designed shock mounts.

Use ACTION Card, opposite page 64. Encircle No. 31

Precision contour projector

The Covet No. 14 optical comparator is a complete checking instrument which provides accurate measurement of difficult dimensions. All measurements are taken by direct readings from precision-built indicators.

Comparator has a large work ca-



capacity and an optical arrangement that permits it to be used in bright light in the shop. The optics are precision ground and coated to give accuracy and bright, halo-free images. Covet Mfg. Co., Dept. C-5, Benton Harbor, Mich.

Use ACTION Card, opposite page 64. Encircle No. 32

SHELDON
CHICAGO U.S.A.

NEW

Sebastian 13"

**A-5 GEARED HEAD
PRECISION LATHE**



Speed changes easily made by revolving speed dial on headstock



Heavy, multiple Spined Spindle with "Zero Precision" tapered roller bearings



Quick change Gear box provides 60 different threads or feeds — has built-in lead screw reverse



Massive 1-piece, double walled apron with gears running in oil has "1-shot" pressure lubrication system for carriage and ways



Cam action tailstock clamp permits rapid release and instant locking of tailstock



\$1875⁰⁰

F.O.B. Chicago
Less Electricals

This is a completely new Sebastian Lathe designed and built by Sheldon . . . a rugged work horse with extra power, toolroom accuracy and all the modern features that make for money-saving production . . . with all controls centrally grouped in easy reach for safe efficient operation.

Modern, heavy cast-iron pedestal (included in base price of lathe) completely encloses motor and drive . . . with storage space in tailstock leg for tools and chucks.

Run this new Sebastian lathe. Test its performance. You will appreciate the powerful cuts that this lathe can take. Write for circulars on 13" and 15" Sebastian lathes and name of nearest dealer where you can see and operate these outstanding lathes.

SHELDON MACHINE CO., INC.

4202 N. Knox Ave., Chicago 41, Illinois

See SHELDON, BOOTH 702, COLISEUM MACHINERY SHOW, CHICAGO—September 6-17

Encircle No. 331 on Card, Opposite Page 65

**HIGHER SPEEDS!
FASTER GRINDING!**

kipp

AIR GRINDERS

MODEL JA
50,000 R.P.M.

\$42⁰⁰

IN U.S.A.



Weight 12 ounces;
length 6¾ inches;
chuck size ½ inch.
Wheel guard removed
for better illustration.

The RPM's stay up while grinding . . . not only when the grinder runs idle. That means better work—longer wheel life.

High speed grinding with small wheels was a Madison-Kipp development of the late twenties. It was born out of a pressing need in our tool room. Because tool room grinding problems are universal, we believe it will pay you to utilize Kipp grinders in your tool room as generally as we do in our own.

kipp

MADISON-KIPP CORP.

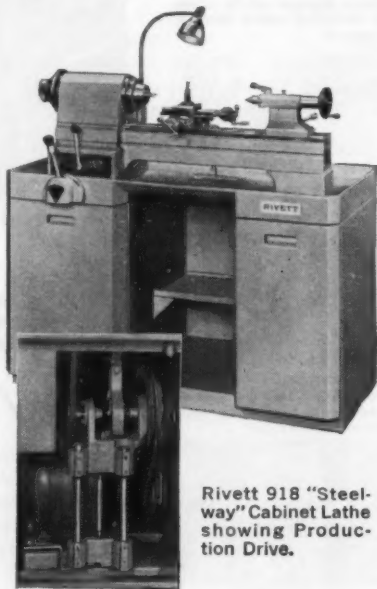
207 Waubesa St., Madison 10, Wis., U.S.A.

Encircle No. 332 on Card, Opposite Page 65

206

Cabinet lathe gives option of production drive, variable drive

The Model 918 Steelway 9" swing cabinet lathe features the option of a production drive permitting one-operator motion for multiple functions and a variable drive for instant selection of any speed from 90 to 3750 rpm. A lever chuck closer is claimed to reduce effort to a minimum; 1½" capacity



Rivett 918 "Steelway" Cabinet Lathe showing Production Drive.

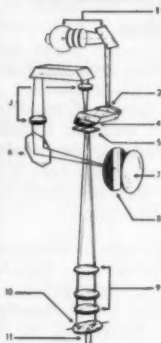
draw-in collets mount directly in spindle mouth; stationary collets have no "in" or "out" motion; step chucks provide accurate holding of circular or irregular parts.

Other features include: double-bevel steelways; self-aligning slide rest; end-less vee belt, replaced without disturbing headstock and drive. Rivett Lathe & Grinder, Inc., Brighton 35, Dept. MTB, Boston, Mass.

Use ACTION Card, opposite page 64. Encircle No. 33

MACHINE and TOOL BLUE BOOK

NEW OPTICAL METHOD GUARANTEES PRECISION



- | | |
|------------------------|------------------|
| 1 Lamp Attachment | 2 Viewing Lens |
| 3 Mounting Frame | 4 Screen |
| 5 Drive System | 6 Objective |
| 7 Plane of Scale | 8 Tilting Mirror |
| 9 Tolerance Block | 10 Contact Tip |
| 11 Flat Surface Mirror | |

USE THE LEITZ PROJECTION ORTHOMETER

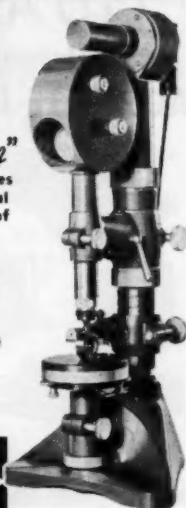
"It's Optical Measuring"

The absence of mechanical or electronic parts assures superior accuracy and reliability since the optical method is practically unaffected by heat, wear of parts, backlash, etc...

This LEITZ ORTHOMETER speeds up inspection, allows more than one person to view scale simultaneously. The only moving parts are the contact tip and mirror.

One graduation represents 50 millionths. Guaranteed accuracy over full range of 200 graduations (.010") is .00001".

BE SAFE — SEND FOR GUIDE
"OPTICAL MEASURING METHODS".



Geo. SCHERR OPTICAL TOOLS, Inc.

200-MT LAFAYETTE STREET • NEW YORK 12, N.Y.

Encircle No. 333 on Card, Opposite Page 65

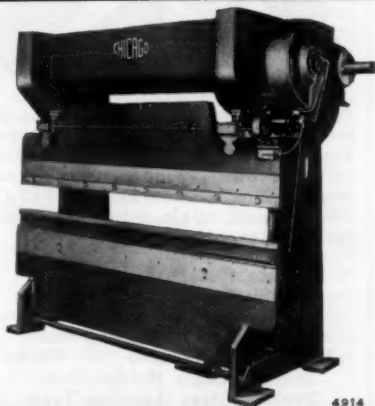


STEEL PRESS BRAKES

43 Standard Sizes

Readily adapted for a wide variety of bending, forming drawing, notching, blanking, punching, embossing, etc.

DIES Complete Line of Induction Hardened Dies for All Makes and Sizes of PRESS BRAKES.



4914

DREIS & KRUMP

MANUFACTURING COMPANY

7440 S. Loomis Boulevard, Chicago 36, Illinois



Encircle No. 334 on Card, Opposite Page 65

QUALITY

Depends on

ACCURATE INSPECTION



Accuracy of measurement depends on the precision of the measuring tools. Provide your Shop and Inspection Department with dependable and proper inspection tools. MEEHANITE METAL TOOLS, made to closer tolerances, are furnished in many types.

Surface Plates—Box Parallels
Slotted Angle Plates
Universal Right Angles
Flat Parallels—Lapping Plates
Toolmakers' Knees—"V" Blocks
Straight Edges (Bridge Type)
Straight Edges (Leveling Type)
Measuring Irons
Masterangle Plates
Angle Attachments

Send for Bulletin

ACME TOOL CO.

71 W. Broadway New York 7, N.Y.

(Advertisement)

New Method Makes Higher Quality Marking Devices

Use of highest quality tool steel and carefully controlled heat treatment in the production of all types of marking devices including steel stamps, inspector's code symbol stamps, embossing dies, marking hammers and roll dies increases life of the devices and reduces overall cost to the user.

The complete line of these steel marking devices is described in Catalog NM-51, available on company letterhead from New Method Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Michigan. Also described and illustrated are type holders and interchangeable type, automatic roll markers for screw machines, logotypes, etc.

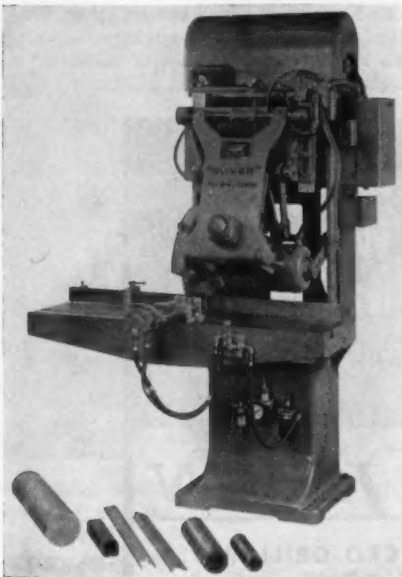
New Method Steel Stamps also maintains complete facilities for production marking, precision engraving and profiling.



Free 12 page illustrated catalog describes complete line of marking devices and facilities for production marking, precision engraving and profiling. Available on company letterhead from New Method Steel Stamps, Inc., 147 Jos. Campau, Detroit 7, Michigan.

Hydraulic cutoff saw

A hydraulic Straitline cutoff saw for aluminum extrusions, billets, copper and brass bars, tubing, etc., has been developed by the Oliver Machinery Co., Dept. B, 1025 Clancy Ave., Grand Rapids, Mich. The machine is designed



to cut non-ferrous metals without burr at a high rate of production.

Equipped with a $7\frac{1}{2}$ hp, 3600 rpm motor, and a 28 per minute maximum stroke for 6" wide material. The table is cast iron 15"x48" with aluminum throat plate and opening with chute for automatic removal of pieces up to 6" long.

Use ACTION Card, opposite page 64. Encircle No. 34

Cycling power feed unit controlled by interchangeable cams

Cam-controlled automatic feed cycles for precision metalworking operations are provided by a new cycling power feed unit.

This self-contained mechanical unit

For Arbor Spacers and Shims, Feeler Stock or Shim Stock...

specify top-quality



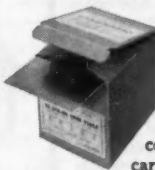
ARBOR SPACERS AND SHIMS

20 arbor sizes $\frac{3}{4}$ " to 4" . . . 19 thicknesses .001" to .125"

Specify with or without keyways. Also available—hardened and ground spacing collars (with standard keyway) $\frac{1}{4}$ " to 3" long in all popular sizes. (For use in milling, slitting and gang-saw setups, shimming gears and bearings.)

FEELER STOCK

Made from tempered stock, rolled to close tolerances. $\frac{1}{8}$ " x 25' coils packaged in transparent plastic boxes, except above .020". Strips $\frac{1}{8}$ " x 12", in cellophane. 27 thicknesses. All thicknesses from .001" to .032". (For use in precision fitting, checking clearances, inspection and production work.)



SHIM STOCK

Selected from material rolled to precision limits, free from burrs, and protected by oil coating. Coils packed in carton for easy dispensing and protection. 15 thicknesses .001" to .032". Sheets 6" x 12"; coils 6" x 120". Available also in assortment package of 12 thicknesses .001" to .015".

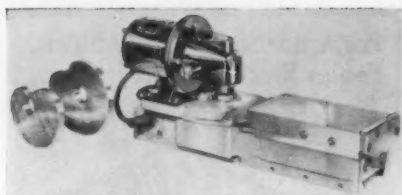
For details and prices, write for descriptive literature.



Detroit Stamping Co.

347 MIDLAND AVE. • DETROIT 3, MICH.

Encircle No. 336 on Card, Opposite Page 65

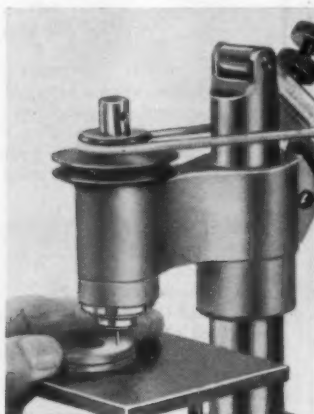


consists of a slide assembly, feed mechanism, cam drive motor and housing.

It is reportedly practical for drilling, tapping, boring, reaming, sawing, milling, broaching and other work on parts of relatively small size.

Variation of feed cycles is possible by changing cams, which can be done in two or three minutes. The unit measures 17" long, 6" wide and 8-½" high. It can be mounted in a horizontal or vertical plane, or at any angle.

Use ACTION Card, opposite page 64. Encircle No. 35



**SMALL DRILLS
MUST BE HELD
IN PRECISION COLLETS
TO ASSURE ACCURACY**

LEVIN

MICRO-DRILL PRESS

Designed to hold small drills in precision collets, thus overcoming the difficulty of making a drill run true as when held in a conventional drill chuck.

Absence of a sliding quill guarantees maximum sensitivity with fingertip control. A mounted ¼" capacity chuck can also be used.

Send for Catalog "M" describing Micro-Drill Press, full range of collet sizes, Micro-Drills, accessories and other precision tools.

LOUIS LEVIN & SON, INC.
3610 S. Broadway
Los Angeles 7, Calif.



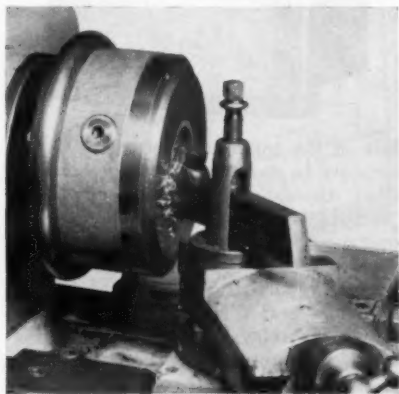
For Very
Small Holes
Down to .002"

Encircle No. 337 on Card, Opposite Page 65

Magnetic chucks

Two types of rotary permanent magnetic chucks are now available from Horton Chuck, Dept. B, 12 Canal Bank, Windsor Locks, Conn.

The parallel type with parallel lines of force running the entire width of the chuck face is used for holding small components and thin plates. The circular type with circular lines of force is



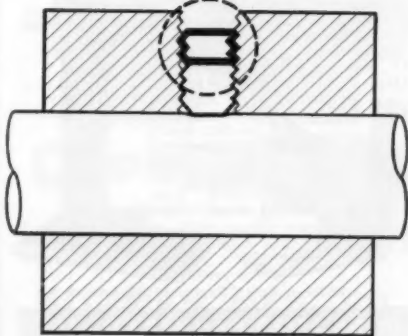
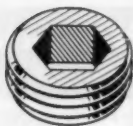
especially designed for holding rough surfaces and for heavy duty turning, milling and shaping.

The rectangular chucks feature a lower over-all height which reduces the size limitation on pieces to be held and the company claims it provides up to 18% greater holding power and 50% or more usable magnetic surface.

Use ACTION Card, opposite page 64. Encircle No. 85

Hollow lock screws

The Mac-it hollow lock screw features heat-treated alloy steel composition for maximum strength, more effective holding power. The "all the way through" design of the hex socket permits adjustment or resetting of the set screw without removal of the lock screw. When set firmly in place, the lock screw presses against the upper surface of the set screw providing extra locking action where it is needed.



SOCKET SET SCREW SECURED BY HOLLOW LOCK SCREW

Lock screws are produced with coarse or fine threads in twelve standard diameters ranging from No. 6 to 1"; the length of the screw is $\frac{1}{8}$ " for sizes No. 6, No. 8, No. 10 and $\frac{1}{4}$ ", larger screws being one-half the diameter in length. Class three fit is standard. Mac-it Division of Strong, Carlisle & Hammond Co., 1392 W. 3rd St., Dept. B, Cleveland, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 86

Automatic control for heating devices

The Amplitrol, an instrument designed to give accurate and fully automatic control of temperature in electric furnaces, ovens and other industrial heating devices, has been developed by the Thermo Electric Mfg. Co., 486 Huff St., Dubuque, Ia.

While utilizing the established prin-

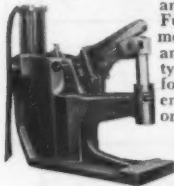
SLASH Production Costs with HIGH SPEED HAMMER!

40 Years of Know-How . . .
Yours for the Asking

ASSEMBLY PROBLEMS? Let High Speed help find the solutions. Unique engineering and tooling service yours without cost. Send samples of job to be assembled and/or prints. Complete analysis by return mail.

Or, ask for full information on High Speed Staking Machines

and Riveters. Full range of models, bench and pedestal types, motor, foot or air operated. Wire or call today!

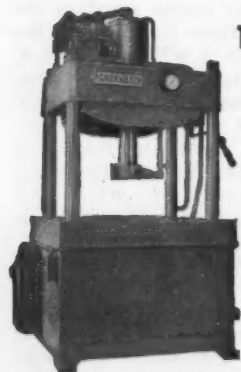


Write or Call Congress 6470 Today!

HIGH SPEED HAMMER CO., INC.
311 Norton St., Rochester 21, N. Y.

Encircle No. 338 on Card, Opposite Page 65

HYDRAULIC PRESSES



**1½ to 75 ton
Capacity**

**Send for
Catalog
Showing
Complete
Line**

GREENERD ARBOR PRESS CO.
141 CROWN ST. • NASHUA, N.H.

Encircle No. 339 on Card, Opposite Page 65
212



principle of the potentiometer, there is no necessity to standardize the instrument, either manually or automatically.

Accuracy is not dependent on the constancy of magnets, springs, bearings or other moving parts, and the instrument is reportedly immune to vibration, dust and dirt. The only moving part is the relay contact. All power is supplied by the service voltage.

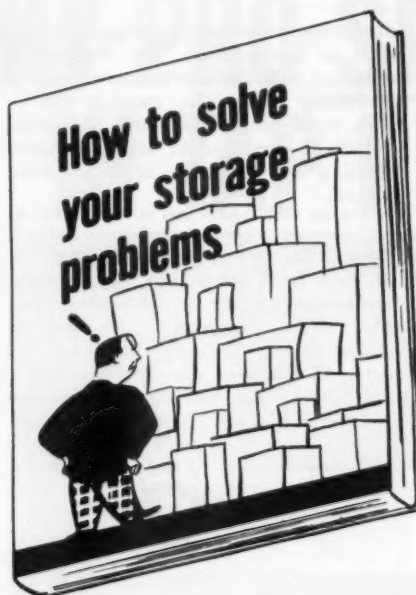
The accuracy of the dial setting is claimed to be within 1% of scale range and the operational band between the on and off points is approximately 4° F. Use ACTION Card, opposite page 64. Encircle No. 87

Free layout service for shelving customers

Equipto Div., of Aurora Equipment Co., Dept. MB, 100 Prairie Ave., Aurora, Ill., now offers free services of stockroom layout specialists who study and survey the customer's storage facilities. In addition to recommendations on steel shelving to provide an efficient and custom tailored installation, such factors as location of stockroom, receiving and shipping areas, parts finding and stock control systems, and lighting are carefully analyzed.

A simplified booklet entitled, "How to Solve Your Storage Problems" tells how to setup facilities, make surveys, elevation drawings, and floor plans. This

MACHINE and TOOL BLUE BOOK

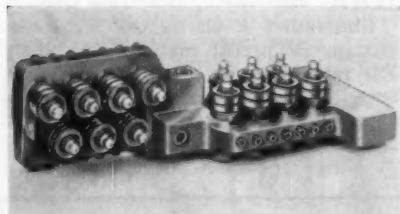


is recommended for smaller layouts where the services of layout specialists are not required.

Use ACTION Card, opposite page 64. Encircle No. 88

Wire straightener

A wire straightener which was designed to straighten small sizes of wire below .062" dia. has been developed by



Durant Tool Supply Co., Dept. B, 136 S. Water St., Providence, R.I.

This unit has seven straightening rolls in each plane. Each roll is mounted on needle bearings and is individually adjustable.

Use ACTION Card, opposite page 64. Encircle No. 89

July, 1955



Hinged Hammer Moulds
1, 2½ and 5 lb. sizes—order your alloy lead hammer requirements from your machine tool supply house

or direct from:

KITZMAN MFG. CO.

15061 Hartwell Ave. Detroit 27, Mich.

Encircle No. 340 on Card, Opposite Page 65

JACO

LOW COST
AUTOMATIC

STOCK REEL

COSTS NO MORE THAN
STANDARD STOCK REELS

POWERED BY
THE NATURAL
SPRING OF
UNCOILING STOCK



3 SIZES — ALL WILL TAKE 6" WIDE STOCK.

24" diameter \$85.00

30" diameter \$89.00

36" diameter \$95.00

Guaranteed — money back if not 100% satisfied

New LOW prices
on the JACO
3-inch and 6-inch
SCRAP CHOPPER



WRITE FOR FULL
DETAILS TODAY!

Dealer Inquiries Invited

JACO DEVICES, INC.

99 HIGH ST., HINGHAM, MASS.

Encircle No. 341 on Card, Opposite Page 65

213

Keyseat cutter has tapered shank, special surface treatment

A new style keyseat cutter has been added to the regular line of Quality Tool Works, Dept. B, Waukegan, Ill. Features of new addition are: tapered shank, premium grade hss, and a special surface treatment after the cutter is finish ground.

In use the cutter shank is locked into a special holder which will fit any standard milling machine. This driving arrangement is claimed to provide a rigid and true-running setup which promotes accuracy and long cutter life.

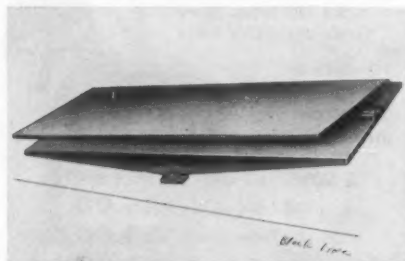
Cutters are available in 41 standard sizes from stock, or special sizes made to order.

Use ACTION Card, opposite page 64. Encircle No. 100

Universal vacuum chuck for holding compound angles

A universal vacuum chuck developed for holding compound angles such as used in the aircraft industry, has been developed by the O. S. Walker Co., Dept. B, 500 Rockdale St., Worcester, Mass.

The distribution of rapid vacuum gives immediate holding and reportedly

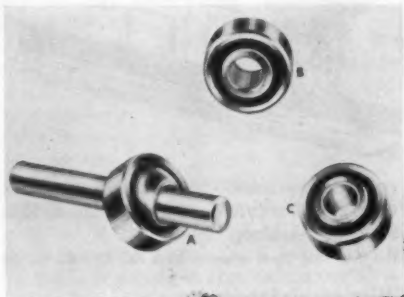


eliminates the possibility of vacuum applied in one section. The vacuum is activated with limit switches to stop all machining before the vacuum diminishes to a dangerous point. A safety feature is provided in tell-tale lights denoting the approach of diminishing vacuum.

Use ACTION Card, opposite page 64. Encircle No. 102

Ball-action, self-aligning bearing

A new type ball-action, self-aligning bearing or bushing with the inner and outer parts separated by a molded natural rubber, Buna S, Buna N, Neoprene or Silcones cushion has many applications. It is used in pillow blocks for line shafts, on electric motors and



other rotating or reciprocating parts where self-alignment, noise reduction and shock absorption are important factors.

Illustration A shows use for intermittent reciprocal motion of a shaft. For rotary motion, needle bearings, B, or a bronze bushing insert, C, can be supplied. A. J. Berna Co., Dept. B, 20160 Sherwood, Detroit 34, Mich.

Use ACTION Card, opposite page 64. Encircle No. 103

Three Big Shows!

Visitors to the National Machine Tool Show, the Production Engineering Show, and the Coliseum Machinery Show, at Chicago, September 6-17, will be impressed! Don't miss these spectacular events. Your visit to Chicago will reward you with ideas for solving your plant's time- and money-saving problems.

HY-PRO SPECIALIZES IN TAP PROBLEMS



TAP PROBLEM? You'll be safer to call on Hy-Pro. They specialize in solving all tap needs.



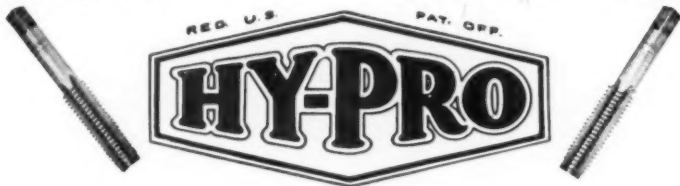
HY-PRO SPECIALIZED ENGINEERS are always ready to work closely with you in analyzing and recommending money saving improvements in your operation.

**... to lower
your unit costs**

Hy-Pro's business is solving tap problems... problems which cost you time and dollars. Because their whole operation is centered on tap business, Hy-Pro can continually concentrate their research and creative staff in analyzing and improving every phase of tap use.

The result has been Hy-Pro's established reputation in production circles as "*The Tap Specialists*," backed by a complete line of high quality taps.

You can contact them directly or through your nearest distributor. Their engineer specialists can help lower *your* unit costs.



HY-PRO TOOL CO., NEW BEDFORD, MASS., U. S. A.
DISTRIBUTORS IN ALL LEADING CITIES

ADDITIONAL WAREHOUSES:

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Piedmont 5-4337

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DETROIT 21, MICH.
University 4-1077

11232 Lawler St. (Worth)
CHICAGO, ILL.
Garden 4-0217

109 Edison Pl.
NEWARK 5, N. J.
Market 2-4513

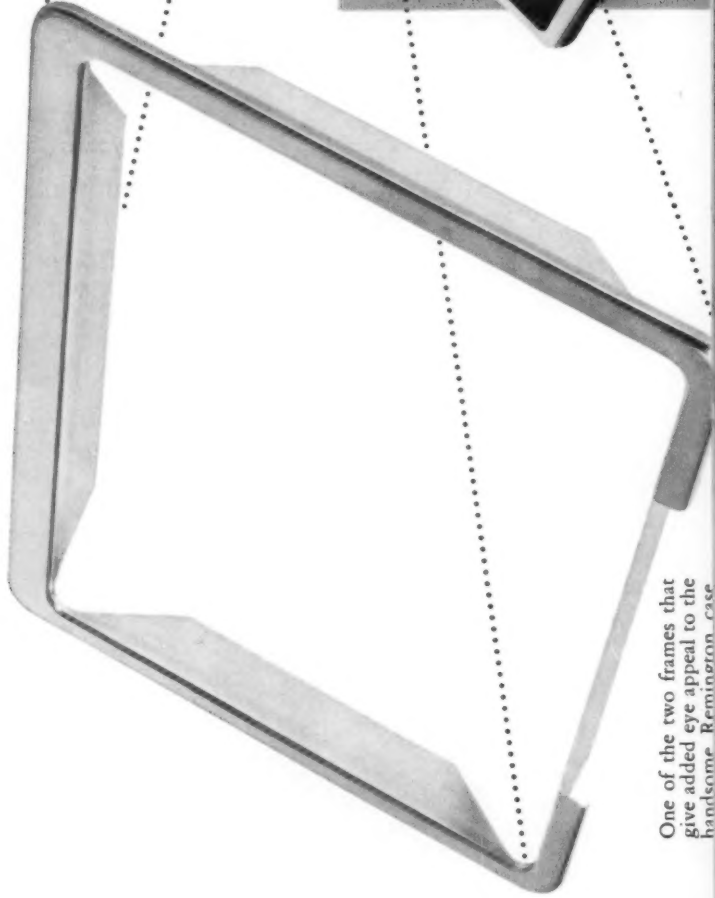
Encircle No. 3A on Card, Opposite Page 65

July, 1955

215

Rejects dropped from 11% to 1%

when Farrington switched to Formbrite for
frames of Remington Shaver case



One of the two frames that
give added eye appeal to the
handsome Remington case

Formbrite* fine-grain drawing brass is harder, stronger,

springier... often polishes in half the time

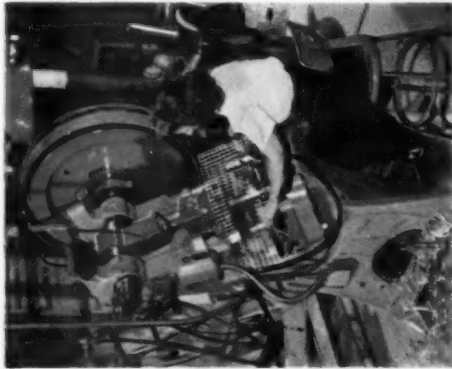
Each day, thousands of these brass frames for the Remington-60 Deluxe Shaver case are made by Farrington Manufacturing Company of Boston. Using ordinary brass, rejects *after polishing* were running at the rate of 11%.

Then Farrington switched to Formbrite. Rejects dropped immediately to less than 1%... and with far less polishing Farrington now gets the best finish they've ever seen. And that's important because the Remington case helps sell the shaver.

You'll find Formbrite surprisingly ductile... it's readily stamped, formed, drawn and embossed. Yet with all its advantages, it costs no more than ordinary drawing brass. We'd like you to know this cost-saving metal better. May we send you descriptive literature (ask for booklet B-39)? A free sample to try in your own shop? Or have a representative call? Simply write to *The American Brass Company, General Offices, Waterbury 20, Conn.* In Canada: *Anacanda American Brass Ltd., New Toronto, Ontario.*

*Reg. U. S. Pat. Off.

6577



Press operator blanks frames for the Remington case out of 6" x .0126" Formbrite drawing brass strip.

Frames are set in fixture for finishing operation on this automatic, three-station polishing machine. Bright, lustrous finish is obtained in one pass through the machine.



Formbrite

FINE-GRAIN DRAWING BRASS

AN **ANACANDA**[®] PRODUCT
made by The American Brass Company

LOOK FOR THESE FEATURES
IN DRILL JIG BUSHINGS

EX-CELL-O

HAS THEM ALL

- ☒ MATERIAL . . high chrome and carbon bearing steel for maximum wear.
 - ☒ FINISH . . precision ground inside and out, and under the head for perfect bearing.
 - ☒ CONCENTRICITY . . assured by grinding on arbors after the holes are finished.
 - ☒ HARDNESS . . deep-hardened to 62-64 Rockwell "C" in automatic equipment.
 - ☒ UNIFORMITY . . of material, dimensions, finish, and hardness.
 - ☒ PROMPT DELIVERY . . from stocks of standard sizes in Detroit, New York, Los Angeles, and London, Canada.
 - ☒ REPUTATION . . largest bushing users in the country are Ex-Cell-O customers.
- Write for Bushing Catalog.

54-32



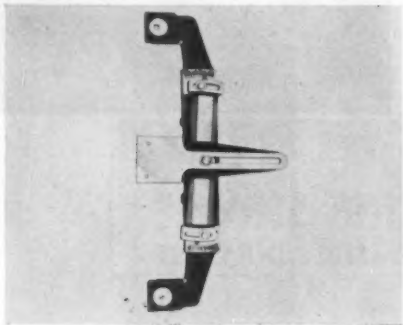
EX-CELL-O for PRECISION

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

Taper attachments clamp on quickly

Heavy duty taper attachments that require only single over arm connection to lathe cross slides, with no other holes to drill, incorporate dovetailing slides or ways to assure accuracy and a simplified method of clamping to any



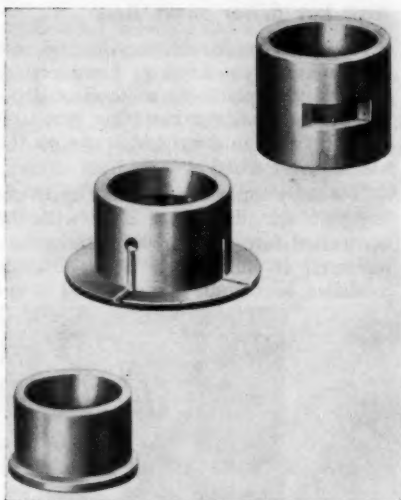
lathe to allow setup in minutes. Only two dimensions need be given for factory fitting: the length of the carriage and the distance across the top of the 45 degree V-way of the lathe to be fitted. Master-Taper Co., Dept. BB, 4543 N. Clark St., Chicago 40, Ill.

Use ACTION Card, opposite page 64. Encircle No. 104

New bearing alloy

Bunting No. 183 is the designation of a new, silvery white bearing metal alloy developed especially for bearing installations in modern food processing machines. The new metal is the product of the Bunting Brass and Bronze Co., Dept. B, 715 Spencer St., Toledo, O. It was developed to combine satisfactory anti-friction bearing qualities, high resistance to corrosion and fine appearance in the sanitary and beautiful machines required by modern food processors and handlers. The chemical composition of Bunting No. 183 metal is as follows: copper 63.00—67.00%, tin 3.50—4.50%, lead 3.00—5.00%, zinc 6.00—10.00%, nickel 19.50—21.50%.

The metal has a tensile strength of 30,000 lb. sq. in., yield strength of 17,000



lb. sq. in., elongation 8% in 2" and Brinell hardness of 500 Kg—95, 1000 Kg—109.

Use ACTION Card, opposite page 64. Encircle No. 105

The Lincoln Electric Co., Dept. B, 22801 St. Clair Ave., Cleveland 17, O., has introduced a new universal, combination arc welder which gives a choice of either ac or dc current. Called the Idealarc, it is said to provide an ideal type of welding arc, either soft or forceful, for every type of manual welding application.

Use ACTION Card, opposite page 64. Encircle No. 106



New key driver saves time

A key driver for driving die and sow block keys in forging hammers is claimed to replace the method of driving keys by using a battering ram suspended from an overhead crane on the building structure.

The driver operates pneumatically using plant air, delivers a blow with the controlled force of an 800 pound steam hammer, if desired. It is a portable modified horizontal hammer and is us-



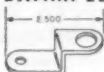
A SMALL LOT METAL STAMPING SERVICE AT LOWEST POSSIBLE DIE COST



Regardless of the small quantity needed, DR Stamping Service gives you quality, accuracy and economy. In addition to blanking and piercing operations, our process includes forming operations. Uniformity is assured no matter how many times you reorder. Changes such as relocating holes or changing size done at very moderate cost.

You will find that the DR Method of producing metal stampings, where quantity lots are limited, gives you worthwhile cost savings because of the high cost of conventional tooling on such requirements.

EXAMPLE



\$22.60 for first 100 pieces including tools.
\$4.10 for each additional 100 pieces.
Plus actual market price of material for stamping.

Send us a blueprint of your stamping needs and we will send quotation.



DAYTON ROGERS
Manufacturing Company

MINNEAPOLIS 7C, MINNESOTA

Encircle No. 342 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

ually handled by a fork-lift truck. Average key driving time, including carrying the key driver to and from the hammer, is claimed to be cut to twenty minutes. Erie Foundry Co., Dept. MTB, Erie, Pa.

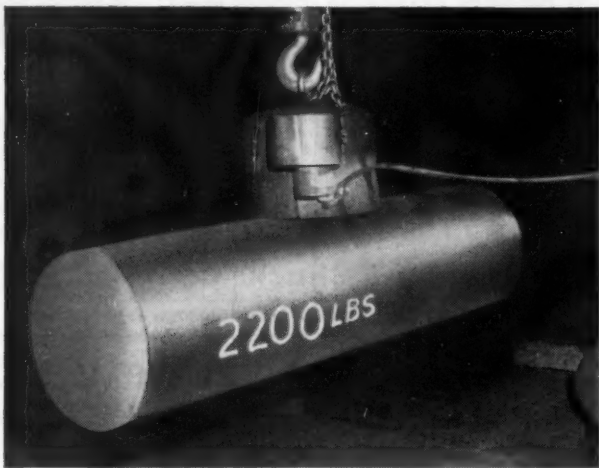
Use ACTION Card, opposite page 64. Encircle No. 36

Bottom-type tapping machine

A number of basic improvements in the Tapmaster design involving relocation of the lead screw to the bottom of

the spindle shaft, the use of an automatic dial selector to set the number of tap turns, and an electric brake to halt the tap at the end of each stroke, have been announced by Prutton Corp. Dept. B, 5295 W. 130th St., Cleveland, O. The machine, available in 5 three-spindle models, will tap hole diameters from $\frac{3}{8}$ " to 6" tap size, with a standard stroke to 3". It is also employed to cut external threads.

Advantages of the bottom-type tap-



Walker Does It Again

The strongest lifting magnet pound-for-pound ever made. Complete saturation . . . maximum efficiency . . . minimum wattage. Shown here - WALKER magnet lifting, with 12" line contact, solid steel cylinder 13.5" diameter, weighing 2200 pounds, and utilizing about the same wattage as your kitchen lamp.

WALKER magnets lift up to 50,000 pounds.

O. S. WALKER COMPANY INC.

Worcester 6, Massachusetts

Encircle No. 343 on Card, Opposite Page 65

CUT . . . operating — maintenance — spoilage **COSTS!** ON YOUR TAPPING JOBS!

Proconier tappers are the solution to steadily rising production costs on many tapping operations. They have the unique construction features that permit inexperienced operators to tap like experts. In addition, they provide many extra hours of continuous, accurate tapping without frequent "down-time" interruptions, producing more pieces with fewer rejections, less spoilage and a minimum of broken taps.

Check these advantages: New sensitive double cone friction clutch; soft cushioned action driving pressure; ball bearing equipped; heat treated gears; special balanced gear reversing mechanism, plus many others.

Write for free brochure giving full details on the complete line of Proconier Tapping Heads.



Exclusive
"Tru-Grip"
Tap Holder

smaller, lighter, more accurate, taps close to walls.

PROCUNIER Safety Chuck Co.

14 South Clinton Street,
Dept. 7, Chicago 6, Ill.

Encircle No. 344 on Card, Opposite Page 65



LARGEST variety of . . .

standard circular FORM TOOLS and BLANKS.

Over 600 sizes carried in stock for
IMMEDIATE DELIVERY.

It's no longer necessary or economical to "hand grind" tools or purchase "made to order" tools for short run jobs. Let SOMMA STANDARD CIRCULAR

FORM TOOLS give you uniform, correct dimensions, better finish and appearance, less set-up trouble. In short—maximum production at the lowest cost.

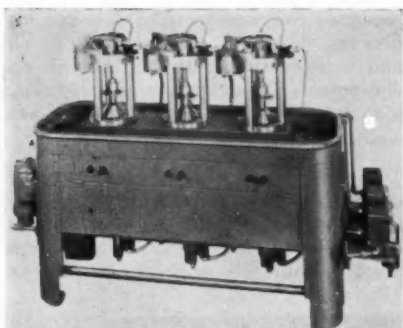
Send for new catalog now listing DAVENPORT STANDARD TOOLS and BLANKS as well as many new sizes of BROWN & SHARPE STANDARD TOOLS and BLANKS.

West Coast Warehouse: 576 No. Prairie, Hawthorne, California

SOMMA TOOL COMPANY Inc.

Manufacturers of Standard and Special Precision Form Tools
21 BROWN STREET • WATERBURY, CONN.

Encircle No. 345 on Card, Opposite Page 65



ping made possible with this design are reported to include faster, easier feeds with both manual and automatic cycles; gravity chip disposal for full depth tapping in blind holes.

Use ACTION Card, opposite page 64. Encircle No. 37

Notcher cuts to 7½"x7½"

The J. F. Kidder Mfg. Co., Inc., 390 Colchester Ave., Burlington, Vt., has introduced a hand operated machine for making a 90 degree notch up to 7½"x7½". Mild steel up to 14 gauge can be accommodated, and stainless steel up



July, 1955

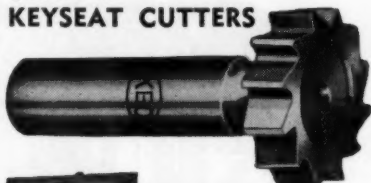


CENTER DRILLS



Made of finest high speed steel. Available in all standard sizes. Always in stock for immediate delivery. Specials made to your specifications.

KEYSEAT CUTTERS



High speed. Right hand ½" shank. Diameter from ¼" to 1½". Standard sizes in stock for immediate delivery. Complete set —41 sizes—available in sturdy, hardwood box. Saves time and money, because you always have the size you need.



CENTER REAMERS

High speed steel. Reamers from ¼" to 1" regularly furnished with 60°, 82°, 90° included angle. Specials made for your specifications.

LATHE MANDRELS



Precision made of tool steel, hardened and accurately ground. Tapered .0005" to the inch. Mandrels from 8/16" to 1" are .0005" undersize at small end, from 1½" to 3", .001" undersize. Immediate delivery.

Write for Literature

Illustrated literature and prices on all KEO Products mailed on request.

KEO CUTTERS

19326 Woodward - Detroit 3 Mich.

Encircle No. 346 on Card, Opposite Page 65

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to 16 gauge.

Weight of unit is 270 lb.; bench space required, 21"x16". Extra blades, either standard alloy or high carbon, high chrome, are available singly or in sets of four.

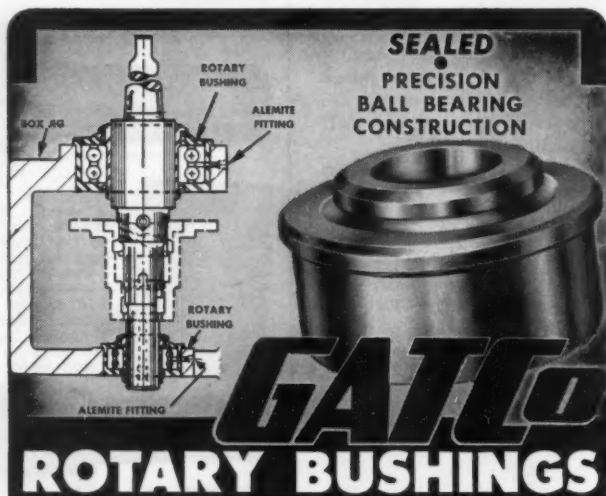
Use ACTION Card, opposite page 64. Encircle No. 39

Spiral surface mill

The Relco five-fluted spiral surface mill, tipped with carbide is claimed to remove more metal with fewer passes.

Designed for nonferrous metals and for plastics, it is said to give good finish and accurate cut with little strain on equipment. Lower power consumption, less down time, and long tool life are also reported.

Tool length is nine inches. Cutting surfaces are of carbide, each curved to 20° spiral so that it runs two-thirds of the way around the tool. This design gives a multiple, angular, continuous



FOR DRILLING, CORE DRILLING, ROUGH AND FINISHED BORING

The inner race of the GATCO bushing rotates with the tool, piloting the tool accurately below or above the work—or both.

Eliminates expensive tool construction—Reduces tool wear—Prevents seizure and pilot breakage—Especially adapted where precision is required.

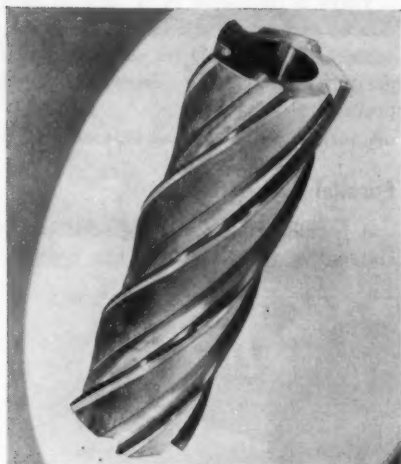
Write for full information and prices

GATCO ROTARY BUSHING CO.

42326 ANN ARBOR ROAD, U.S. 12, PLYMOUTH, MICH.

Telephone PLYMOUTH 1472

Encircle No. 347 on Card, Opposite Page 65



cutting action, in which successive cuts by each carbide edge overlap to distribute the cutting load evenly over the entire surface.

Mill shaves instead of gouges, giving a deep, smooth finished cut. Operation is relatively free of chatter and other strenuous wear and tear on equipment. Relco Carbide Tool Co., Inc., Box 124-BB, Elmwood Station, Providence, R.I. Use ACTION Card, opposite page 64. Encircle No. 40

Solenoid pilot valve controls hydraulic circuits

A solenoid pilot valve, Series 6500, for automatic control of hydraulic circuits has been announced by Rivett Lathe & Grinder, Inc., Brighton 35, Dept. MTB, Boston, Mass. It is the sub-plate mounted type for panel mounting installation and is designed for full 3000 PSI.

Heavy continuous duty, shock mounted solenoids are reported to provide long life and low power consumption. Solenoids operate on 3.6 amps inrush and .45 amps holding at 115 V. Wiring box with terminal strip is dust sealed and provides $\frac{1}{2}$ " conduit connections on each side of the valve. Flow



TO BE SURE OF
QUALITY
Remember
the Name

HOGGSON

STEEL
STAMPS



CHAMFERED
CORNERS
*for locating
the base*

**FINEST
STEEL**

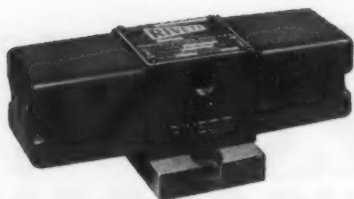
long
life



ALSO IN
REVERSE
FOR
MOLDS
& DIES

Letters and figures, deep-cut in hardened, special-formula steel, assure clean impressions and long service. Wide range of letter sizes. At your Mill Supply or write for circulars.

HOGGSON & PETTIS MFG. CO.
141H Brewery St. New Haven 7, Conn.



capacity is rated at 3.6 gpm. at 15 ft. per sec. Seven spool designs are available.

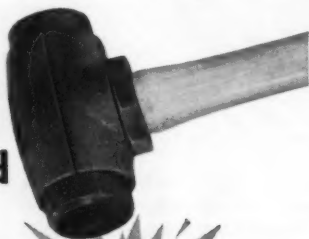
Valve is furnished in $\frac{1}{4}$ " size in both double and single solenoids. The double solenoid is available in no spring, two position, or spring centered, three position.

Use ACTION Card, opposite page 64. Encircle No. 41

Parallel edge scriber

A parallel edge scriber, graduated by sixteenths, from $\frac{1}{8}$ to 1" has recently

**LESS
REBOUND**
per pound
thanks to
"Contact Control"



Jawhead

the best "soft" hammer you can buy!

Special processing controls the rebound for longer striking contact. This means more work with fewer blows, less fatigue. Faces won't mar surfaces, slip, chip, fly off or change with extreme temperatures or use. Cost less, too, and last longer — are safer for work and worker.

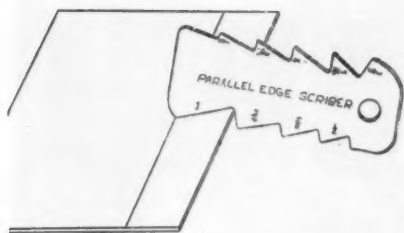


CHANGE FACES IN SECONDS —
Threaded collar locks them in.

• Available from
your local industrial
supplier.

CHICAGO Rawhide MFG. CO.

1301 Elston Ave., Chicago 22, Ill.
In Canada: Super Oil Seal Mfg. Co., Ltd.,
Hamilton, Ontario



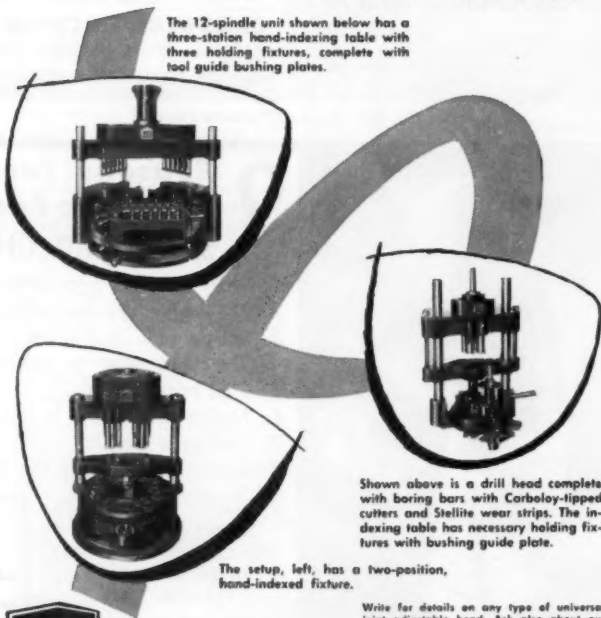
been developed by the Dayton Rogers Mfg. Co., Dept. B, 2824 13th Ave. S., Minneapolis 7, Minn.

This gage is made from cold finished strip steel. Stencil engraved for scribing parallel lines on all sheet stock, including sheet synthetics, plywood, etc. It may be obtained free when requested on a company letterhead.

Use ACTION Card, opposite page 64. Encircle No. 42

IT'S SAFER TO BUY DRILL HEADS, FIXTURES and BUSHING PLATES AS A COMPLETE PACKAGE

The 12-spindle unit shown below has a three-station hand-indexing table with three holding fixtures, complete with tool guide bushing plates.



Shown above is a drill head complete with boring bars with Carbide-tipped cutters and Stellite wear strips. The indexing table has necessary holding fixtures with bushing guide plate.

The setup, left, has a two-position, hand-indexed fixture.

Write for details on any type of universal joint adjustable head. Ask also about our totally enclosed gear-driven adjustable, fixed center, or individual lead screw tapping heads.



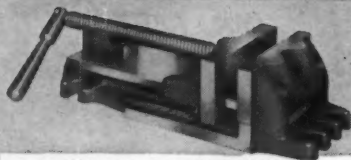
UNITED STATES DRILL HEAD COMPANY

616-618 BURNS STREET • CINCINNATI 4, OHIO

Here's PROOF that
~~SPEED VISE~~
is a fast production tool

Here's a production set-up on a multiple spindle semi-automatic drilling machine that is really cutting manufacturing time and costs. The use of two Speed Vises eliminates the need for expensive and complicated fixtures and at the same time increases the production range. With Speed Vise it is only necessary to make a simple jaw plate to fit the parts being machined and to hold drill bushings, etc.

- ★ Quick action design for speed. Opens instantly to full capacity to handle work of any size.
- ★ Standardized holes for attaching jigs or jaw plates.
- ★ Lift...slide...lock...that's all there is to the fast, positive locking action.
- ★ Heavy, semi-steel castings for extra strength and a heavy base plate for rigidity.

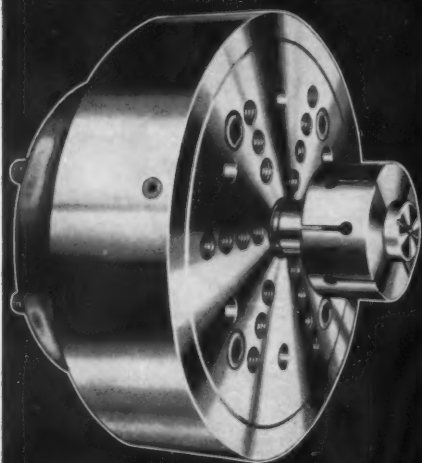


Write now for Bulletin 30-MM

CARDINAL MACHINE CO.

1819 Dana Street, Glendale, California

Encircle No. 351 on Card, Opposite Page 65



9 Reasons for You to get the Facts on SPEEDGRIP CHUCKS

1. They increase production.
2. They give greater accuracy.
3. Set-up time is shorter.
4. They are safer to operate.
5. First cost is low.
6. Maintenance cost is low.
7. Design is simple.
8. Guaranteed to do the job.
9. Service is prompt.

Speedgrip Precision
Internal Chucks will save
you money on second
operation work.

WRITE FOR FREE MANUAL



SPEEDGRIP CHUCK

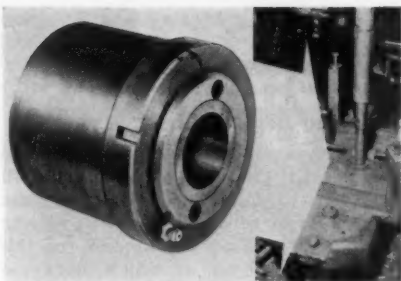
820 N. WARD STREET
ELKHART, INDIANA

Encircle No. 352 on Card, Opposite Page 65

Live bushing increases speeds & feeds

According to the manufacturer, Jergens live bushings are proving their ability to hold tolerance, reduce tool breakage, bar wear and scoring, chatter and spindle bearing wear and at the same time increase speeds and feeds.

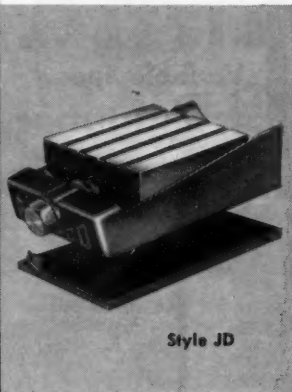
Bushings are being used as drill, pilot bar, boring bar, milling arbor bushings, thrust and pilot bearings for recessing tools, rotary stops, and as a quick change



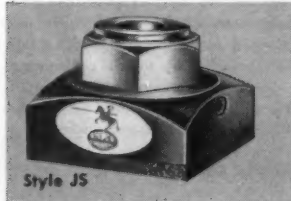
CUT MACHINE MAINTENANCE COSTS with **EMPCO** leveling jacks

EMPCO Leveling Jacks cut down on set-up time and keep maintenance costs to a minimum! They provide a solid, level support for machine tools, assembly fixtures, industrial furnaces, and all types of production equipment. Machines leveled with EMPCO Jacks are easily installed and relocated—maintain new-machine performance longer! Equipment can be re-leveled in a matter of seconds by a simple turn of the hex screw.

VI-SORB Mounting Pads are optional with EMPCO Jacks. They control vibration from within the machine itself, and reduce transmitted vibrations.



Style JD



Style JS

Available in two styles and 6 models, there's an EMPCO Jack for your every requirement. Write today for complete information and illustrated bulletin!



THE ENTERPRISE MACHINE PARTS CORPORATION

2741 JEROME AVENUE

•

DETROIT 12, MICHIGAN

packaged sealed bearing unit. Jergens Div., Donley Products, Inc., Dept. BB, 11106 Avon Ave., Cleveland, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 50

Precision boring units

A new series of precision boring units engineered for semi-automatic and fully-automatic work control, the Hydro-Borer series "N", can be set for rapid approach to within .015" of the piece to be bored, at which point the

standard hydraulic feed automatically takes over and bores at .004" per revolution. When it completes this stage, it automatically repeats the cycle or returns, depending on the setting. There can be an infinite number of such successive rapid approach and boring operations within the stroke of the unit.

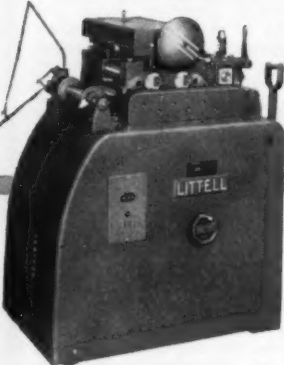
The new features of these units include: (1) an electronically controlled, air-actuated, automatic rapid travel

straighten coil stock as you feed it

with a



LITTELL
Variable Speed
Straightener



Model 412-SPD Heavy
Duty Straightener
Straightens steel up to
.125" thick and up to
12" wide

A Littell straightener removes the curvature from coil stock. The press, slitter or shear receives a continuous strip of pre-straightened stock. Equipped with variable speed transmissions, Littell Straighteners are adjustable to meet a wide range of speed requirements in automatic feeding. They also simplify hand feeding. A variety of medium and heavy duty models straighten coil stock of all standard widths and thickness.

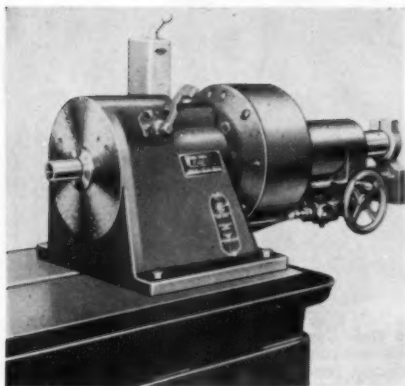
Write for the Littell Straightener Catalog



ROLL FEEDS • DIAL FEEDS • REELS
STRAIGHTENING MACHINES • AIR BLAST VALVES

District Offices: Detroit, Cleveland

4147 N. RAVENSWOOD AVE., CHICAGO 13, ILL.



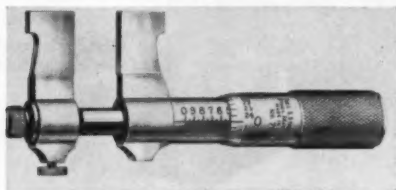
mechanism with adjustable controls for successive rapid travel and boring operations; (2) a solenoid-actuated automatic trip and spindle return mechanism; (3) Meehanite front and rear bearings which are under constant pressure lubrication.

Feed is reduceable to .002" per revolution when an extra fine finish is required. Standard models are equipped with a $\frac{3}{4}$ hp 220-440 volt, 3-phase 50-60 cycle electric motor with flat-ribbed belt drive and 4-step pulley for 450, 885, 1395, and 2000 rpm drive. Hydro-Borer Co., Dept. MTB, 1601 E. Olympic Blvd., Los Angeles 21, Calif.

Use ACTION Card, opposite page 64. Encircle No. 44

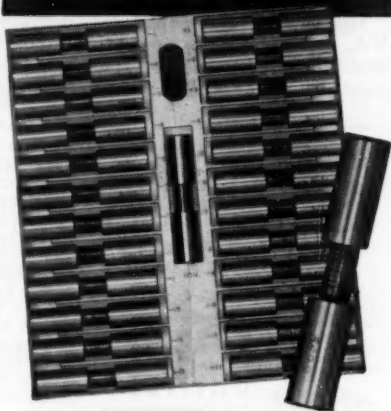
Inside micrometer caliper has 1"-2" range

The Starrett No. 700 inside micrometer caliper combines the quick-reading features of a micrometer with Vernier caliper-style jaws. It has a range of



July, 1955

CLOSER PRODUCTION TOLERANCES!



DELTRONIC Tenth Plug Gauges

save time and material, too!

This new system of precision gauging in sets of 25 provides one gauge of nominal size plus 12 gauges of increasingly larger sizes in .0001" increments and 12 gauges of decreasingly smaller sizes in increments of .0001".

- ★ Size variation by ten thousandths
- ★ Available in increments of 1/64" from 1/8" to 1"
- ★ Set of 25 costs approximately same as Go and No Go gauge
- ★ Hardness is Rockwell C62/C64

For further information write Dept. D.

DELTRONIC CORPORATION
1507 RIVERSIDE DRIVE
LOS ANGELES 31, CALIF.

Encircle No. 355 on Card, Opposite page 65

1" to 2" by thousandths of an inch. The jaws are hardened and ground on a radius. Satin chrome finish eliminates glare and eye strain.

Use ACTION Card, opposite page 64. Encircle No. 45

Coil cradle

U.S. Tool Co., Inc., Dept. BB, Ampere, N.J., has announced the addition of a Multi-Roll cradle. It has a material capacity of up to 9" in width and 1/8" in



TORIT UNITIZED DUST CONTROL

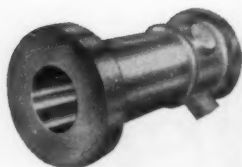
*eliminates
dust
at its
source!*

Torit Unitized Dust Control means each machine has its own custom-tailored dust collector designed to work specifically for *that* machine. There is no guess work, or average suction. Furthermore, dust control is provided only when that machine is running . . . there is no waste of power such as you have with centralized control when only a few machines are operating. This means better dust control at lesser operating cost and less initial installation cost. Get the facts now on how Torit will work better to . . . "CLEAR THE AIR".

See our catalog in Sweet's Machine Tool File, or write:

TORIT MANUFACTURING CO.
303 WALNUT STREET • ST. PAUL 2, MINN.





Bored and Honed Parts TO SPECIFICATION



from seamless tubing with welded flanges and bases, from solid bar stock, or from forgings with flanges and pads forged integral—heat treating to specified physicals. Close tolerances rigidly maintained. Send drawings for estimates.

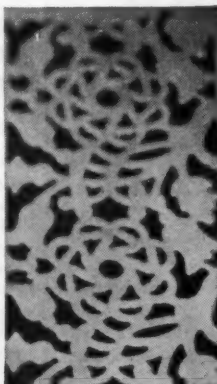
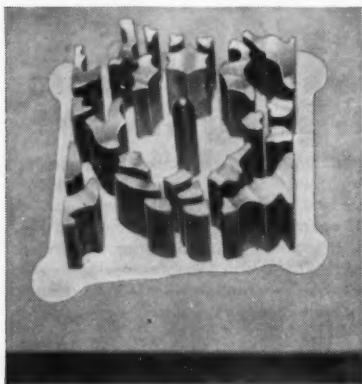
MANUFACTURERS OF HYDRAULIC CYLINDERS • SPINDLES • SLEEVES
CLUTCH SHAFTS • PISTON RODS • RAMS • QUILLS, ETC.

AMERICAN HOLLOW BORING CO.

1955 Raspberry St.,

Erie, Pa.

Encircle No. 357 on Card, Opposite Page 65



Photos courtesy Stebbins Tool & Die Co.

SKEPTIC BECOMES ENTHUSIAST

Another skeptical prospect now an enthusiastic customer. 60 hours time saved by using 5 pounds of Cerromatrix and "The Method" in building this complicated perforating die for .020" thick, half hard brass. Die still in perfect condition after producing over 100,000 pieces. Die made by Stebbins Tool & Die Co., Bronx, for Embassy Metal Products Co., New York.

Save time with Cerromatrix—write for Booklet—Cerromatrix Method of Punch & Die Setting. And when you buy, insist on genuine Cerromatrix. There's a difference.



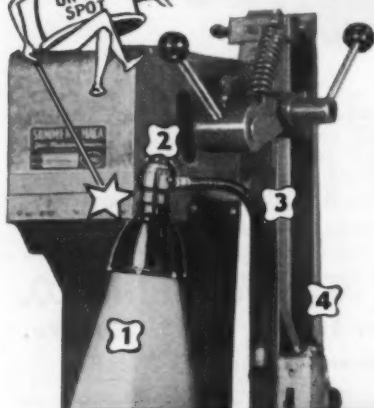
CERRO DE PASCO CORPORATION

Dept. 7, 40 Wall Street, New York 5, N. Y.

VIMCO Lights



for long lighting life
on key working areas



ON THE SPOT VIMCO FEATURES

- 1** Non-glare—eye easing light
- 2** Vimco-tight swivel socket
- 3** Sturdy, adjustable arm
- 4** Simplified Vimco installation

Six standard models for every need
(special design service for OEM)

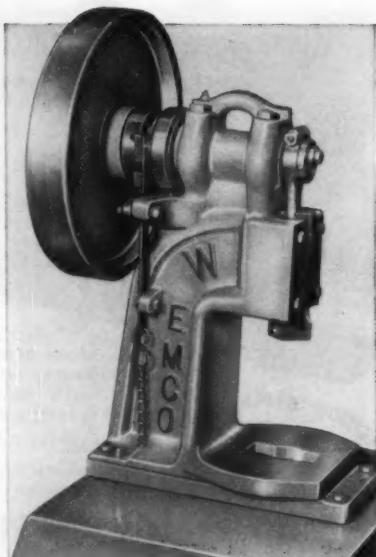
Photo courtesy Sommer & Maco
Glass Machinery Co.

VIMCOLIGHTS ARE  LISTED

VIMCO MFG. CO., Inc.

Since 1919

109 Bayton St. — N. Y.



EMCO "W", bench type, 5-ton; also larger EMCO "X", 10-ton. Both sizes also stand-mounted. With or without motor drive.

EMCO POWER PUNCH PRESSES

are **SPEEDY** and **SAFE**

Versatile EMCO presses excel for punching, forming, stenciling and riveting metal, leather plastics and other non-metallic materials. Up to 300 operations per minute. "Big machine" speed, strength, rigidity, accuracy, endurance. Compact, fool-proof; simple design—easy to operate. Thousands of EMCOS in money-making use testify to Klaas' dependability since 1921.

Ask for our Bulletin "B-7"

UNUSUAL
AIDS
TO
INDUSTRY

**THE KLAAS MACHINE
& MFG. CO.**

4346 East 49th St.
Cleveland 25, Ohio

KLAAS-BUILT

Encircle No. 359 on Card, Opposite Page 65
234

Encircle No. 360 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

FIRST CLASS
PERMIT NO. 272
SEC. 34.9, P. L. & R.
WHEATON, ILLINOIS

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MACHINE and TOOL BLUE BOOK

JULY, 1955

Please send the following literature which I have encircled below:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51

NAME..... POSITION.....

COMPANY

STREET

CITY..... ZONE..... STATE.....

Tear Off and Mail These Postage-Paid Postal Cards

MACHINE and TOOL BLUE BOOK

JULY, 1955

Please send the following literature which I have encircled below:

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35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51

NAME..... POSITION.....

COMPANY

STREET

CITY..... ZONE..... STATE.....

thickness. Coils with od up to 40" and a weight capacity of 1500 lbs.

Mechanical specifications: 1/3 hp, 155 rpm geared motor for output speeds up to 80' per minute; loop control mechanism to start and stop the motor; loop supporting roller; two inner frames adjustable individually by cranks to accommodate stock widths up to 9".

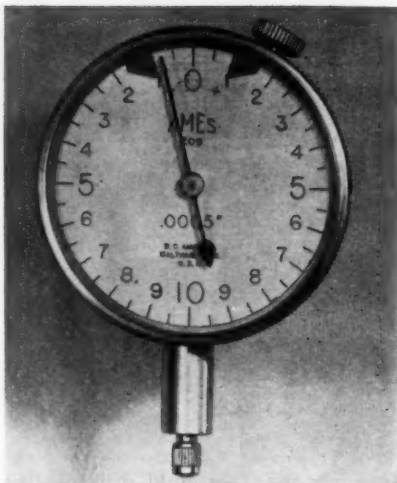
Use ACTION Card, opposite page 64. Encircle No. 46

Tolerance hands for use on micrometer dial gages and indicators

Newly designed tolerance hands have been developed by the B. C. Ames Co., Dept. MTB, 28 Ames St., Waltham 54, Mass., for use on their line of micrometer dial gages and dial indicators.

These hands are located directly above the dial, under the crystal, which is claimed to make the pointers easier to see and eliminate distortion in reading. It also prevents the hands being moved accidentally.

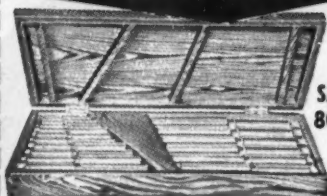
Use ACTION Card, opposite page 64. Encircle No. 47



Twin-spindle multi-drill attachment

A new twin-spindle attachment for the Commander multi-drill, which permits driving two collet type spindles

MANHATTAN'S MIRACLES! GOVERNMENT SURPLUS



SAVE
80%

SET OF CARBON STEEL **ALL NEW** HAND REAMERS

STRAIGHT FLUTE In Wooden Case
SIZES 1/4" to 1-1/4" IN 32NDS

Tremendous savings on all new cutting tools. Send us your inquiries and write for circular listing sensational bargains!

Regular price \$180.
OUR low price
only \$35.00
Limited quantity!

MANHATTAN SUPPLY COMPANY

The Cutting Tool Discount House
151-A GRAND ST., NEW YORK 13, N.Y.
Telephone: CAnal 6-4992

Encircle No. 361 on Card, Opposite Page 65
July, 1955

GREATER ACCURACY FINER FINISH

MADE ON OPTICAL FORM GRINDERS



Schmarje

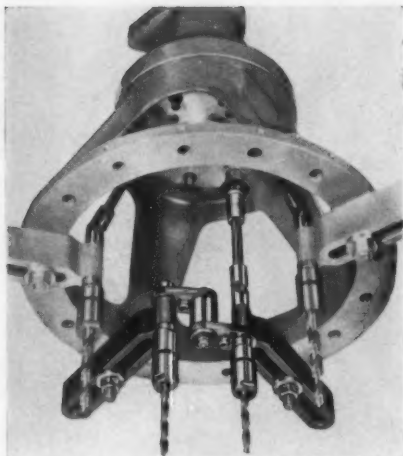
FORM TOOLS

3 Styles • FLAT
• DOVETAIL
• CIRCULAR

Send drawings for Prompt Quotations

SCHMARJE TOOL & ENGINEERING CO.
Carbide Reamers • Form Tools
MUSCATINE 1, IOWA

Encircle No. 362 on Card, Opposite Page 65
235



from any one of the Multi-drill spindles, has recently been announced by the Commander Manufacturing Co., Dept. B, 4225 W. Kinzie St., Chicago, Ill.

The new attachment adds an extra

spindle for each of the multi-drill's standard six or eight spindles, enabling the user to drill up to double the normal number of holes at one time.

A direct gear train reportedly provides maximum efficiency for the driven spindle, yet permits setting the two spindle centers as close as $\frac{1}{8}$ " and a maximum of 3" wide. Maximum capacity of the twin-spindle attachment is $\frac{1}{4}$ " in steel.

Use ACTION Card, opposite page 64. Encircle No. 48

Miter gear right angle drive

The Model RA 225 right angle drive is available with a standard ratio of 1 to 1 and furnishes up to 2 hp at 1800 rpm.

Normally available with a right-hand extension, it may also be furnished otherwise with upward or downward extension, hardened gears or special ratio. The miter gear drive is totally enclosed in a cast iron housing. Precision cut gears are assembled on ac-

Beloit

SLIP ROLL HAND FORMING MACHINE

Operates to full rated capacity by hand or by power! Compact and heavy duty for years and years of hard usage. The two feed rolls, geared together, assure positive feed on even the thinnest material. The third roll is idle but can be made for gear drive at nominal cost. Completed work is easily and quickly removed. Made in bench and floor models, single and double back geared.

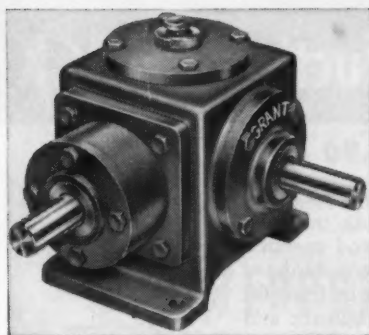
ABOVE:
No. 14 single back geared sliproll, floor model with capacity of 14 ga. 31 other models to meet every need.

Also manufacturers of
Punches, Shears, Rod
Cutters, Bending and
Straightening Rolls.

**HENDLEY &
WHITTEMORE CO.**
100 Blackhawk Blvd. Beloit, Wis.

Encircle No. 363 on Card, Opposite Page 65

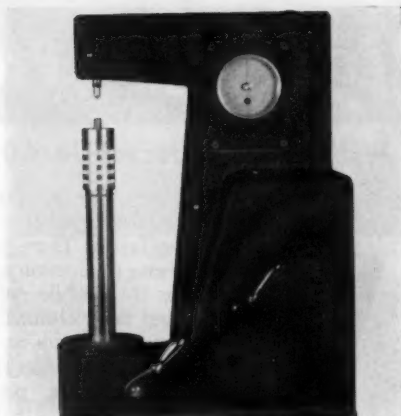
MACHINE and TOOL BLUE BOOK



curately ground shafts and mounted on ball or tapered roller bearings.

Base is $6\frac{1}{4}$ " wide and $5\text{-}13/16$ " high, with extensions 6" from center. Grant Gear Works, Inc., Dept. BB, 171 W. Second St., Boston 27, Mass.

Use ACTION Card, opposite page 64. Encircle No. 49



The J. P. Newman Co., Dept. BB, 821 S. Raymond Ave., Alhambra, Calif., has announced the availability of a 10" capacity hardness tester of the Rockwell type, built to A.S.T.M. standards. Operation of machine is claimed to be trouble free and accurate. Use ACTION Card, opposite page 64. Encircle No. 96

INDEXING TURNTABLES



**C
A
M
S**



Eisler makes over 100 different types of indexing mechanisms for spraying, glass insulators, melting and glass glazing with rotating stations and motorized or hand operated. Rotating tables of all kinds for over 35 years. We supply any part or complete equipment and we make special turntables and cams to your specifications. You are invited to see our showroom and see for yourself our many models on display. Write or call for our new catalog No. 88-56.

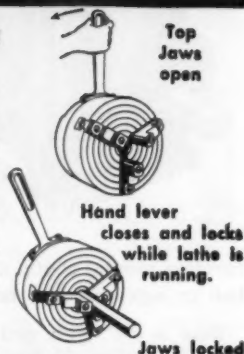
CHARLES EISLER JR., PRESIDENT
EISLER ENGINEERING CO., INC., 762 So. 13th Street, Newark, N. J.

Labor Saving Production CHUCK

Will pay for itself in 60 to 90 days

On turrets, engine lathes, cutting-off machines, drill presses or any type of chucking machine, the Barker Two-Jaw or Three-Jaw hand operated chuck will increase production up to one third and actually pay for itself while doing it in from 60 to 90 days. Hand lever eliminates pneumatic and hydraulic systems, yet closes and locks jaws with lathe running or stopped. Over 30 years of labor saving, production boosting operation.

Write for bulletin 201 today.



CHUCK DIVISION
THOMAS HOIST CO.
34 S. HOYNE CHICAGO 12, ILL.

Encircle No. 365 on Card, Opposite Page 65

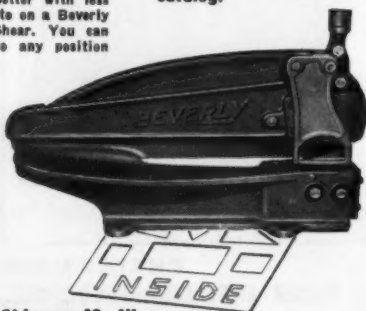
Beverly THROATLESS SHEAR
Cut any Shape... STRAIGHT OR
IRREGULAR



B-3 with Ball
Bearing Hold
Down

Make any cut — curved, straight or irregular, faster, easier and better with less material waste on a Beverly Throatless Shear. You can turn work to any position

and make a clean cut as you go. Handles heavy gauges with ease—lighter metals without distortion. 4 models — capacities 18 gauge to 3/16" mild. All shears equipped with H.C. H.C. Blades for cutting Stainless.



INSIDE SLOTTOR

8" Reach — 16 ga. cap.

Makes inside slotting cutting faster, easier, cleaner. Punch and die arrangement of 5 blades assures accuracy, clean cutting action. Cuts 2 1/2"x1/2" slot at one stroke. Throat design permits pivoting work at any point in stroke for special inside cuts. Note sample cuts at left.

See your Beverly Dealer or write for illustrated catalog.

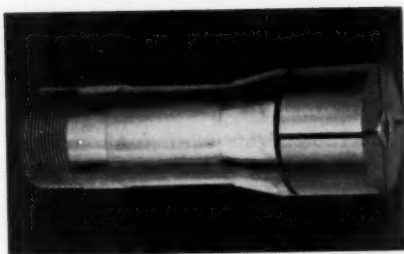
BEVERLY SHEAR MFG. CO., 3005 W. 111th ST., Chicago 43, ILL.

Encircle No. 366 on Card, Opposite Page 65

Holding tool for lathes and grinders

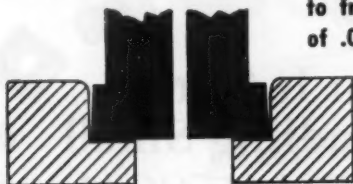
A holding tool for use on lathes and grinders has been announced by Royal Products, Dept. B, 88 Union St., Mineola, L.I., N.Y.

These internal collets are self-releasing and fit standard 5C lever and hand-wheel drawbars. With all parts and pads hardened and ground, tolerances up to .0001 are claimed to be easily achieved

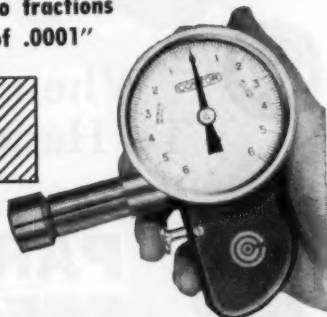


COUNTERBORES and BLIND HOLES now easily gaged

to fractions
of .0001"



Unique 2-point gaging at tip measures to very bottom of shoulder or hole.



COMTORPLUG with interchangeable expanding plugs to gage simple or special bores from 1/8" to 8" dia.

Unique Advantages

Positive gaging accuracy to fraction of .0001" regardless of who operates it.

Indicates actual size, a fixed—not passing—reading.

Positive 2-point gaging—automatic centering.

Shallow holes, deep holes, inside splines, open-end holes gaged easily.

Detects ovality, back or front taper, bell mouth, barrel shape.

Reaches to bottom of blind holes.

Gages work while still held in chuck.

A shop tool for all-day every day use.

Portable—no wires, hoses or stands.

Investigate the gage used by the thousands in jet engine, guided missile, farm machinery, automotive transmission, household appliance and other volume-precision plants. **IT MAKES PRECISION GAGING EASY...** at machine... at inspection bench... for selective assembly. No other like it—investigate and see why.

COMTOR COMPANY

62 Farwell St.
WALTHAM 54,
MASS.



GET THE FACTS—REQUEST BULLETIN 48

Encircle No. 367 on Card, Opposite Page 65

by touch-grinding pads or using machinable pads with given setups.

Use ACTION Card, opposite page 64. Encircle No. 90

Overflow sights

Overflow sights used in oil lines of circulating systems are claimed to maintain a constant visible oil level. They permit checking of liquid flow and clarity of liquid at a glance.

Flow of liquid is upward through bottom center inlet overflowing stand

pipe, draining through side outlet. Oil-Rite Corp., 2374 Waldo Blvd., Manitowoc, Wis.

Use ACTION Card, opposite page 64. Encircle No. 91

Forged high speed steel tools

A specialized process of forging reportedly makes each forged high speed steel tool stronger than the metal from which it is formed.

The grain structure of the blank coincides with the contour of the tool

When It Comes
To Handling Small
Parts - SYNTRON
**PARTS
FEEDERS**

... provide
automatic, controlled
feeding at lower costs

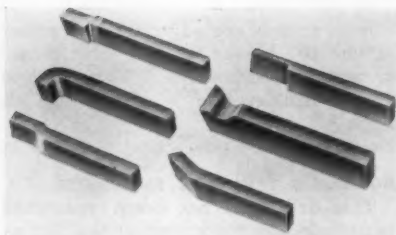
Handle small parts of nearly any shape or material in oriented position—single file—without damage. Instantly controllable feeding rate insures steady flow of parts at required production speeds. Electromagnetic—no mechanical wearing parts—ideal for use in automation set-ups.

Write for **FREE**
Catalogue Data

SYNTRON COMPANY

300 Lexington Ave.

Homer City, Pa.



side grain, which successfully resists normal operating stresses and strains. A hardness up to Rockwell 69 is claimed possible. Modern Tools Div., Nelco Tool Co., Inc., Dept. BB, Berlin, Conn.

Use ACTION Card, opposite page 64. Encircle No. 92

Lever lock moved on hacksaw frame

Two new hacksaw frames introduced by Victor Saw Works, Inc., Dept. B, Middletown, N.Y., feature a new placement of the lever lock that tensions the

and cutting is actually done with the

You'll Want This New Catalog



On the NEW Hanna Cylinder Line

It gives complete details of sizes, models and other data on the new Hanna T 750 Cylinders with capacities up to 250 p.s.i. air, and up to 750 p.s.i. hydraulic.

Write today—No obligation

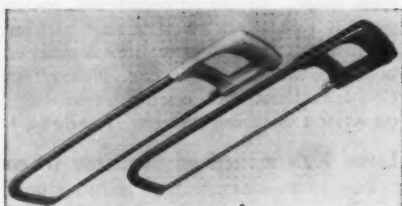


Hanna Engineering Works

HYDRAULIC AND PNEUMATIC EQUIPMENT... CYLINDERS... VALVES... RIVETERS

1754 Elston Avenue • Chicago 22, Illinois

Encircle No. 369 on Card, Opposite Page 65



Both frames are adjustable for either 12" or 10" blades in either horizontal or vertical positions. Both have molded Tenite handles and will stand up on edge.

Use ACTION Card, opposite page 64. Enclrele No. 93

Automatic drill unit redesigned

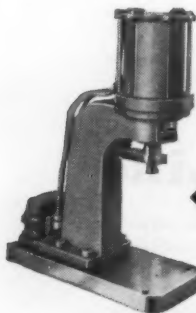
This drill unit has been redesigned to include a motor known as the "Dina-brake," which has an integral brake winding for quick stopping of the drill.

blade. The entire backbone of the frame is a one-piece solid steel bar.

SAVE!

WITH A HANNIFIN AIR PRESS

It's the ideal press for that occasional pressing job. These presses operate off ordinary shop air supply. They're fast and safe. Over 30 models to choose from...many for either bench or floor mounting. Capacities from ½ to 18 tons. Day-light to 46 inches...reach to 12 inches. Prompt delivery.

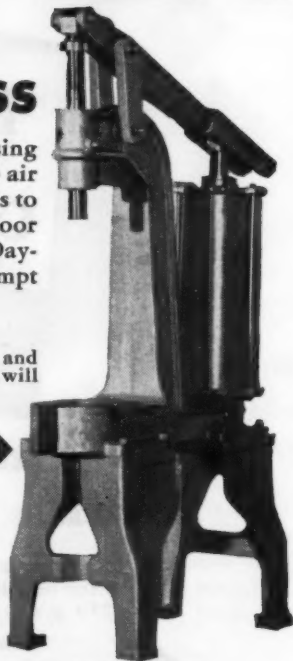


WRITE. Complete information and prices on Hannifin Air Presses will be sent on request.

6 Tons (Model B-2) One of more than 30 models. Press with base, \$554.

1-ton Hand-D-Press. For small parts manufacturers. Press, \$232.

Prices F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.



HANNIFIN

HANNIFIN CORPORATION, 529 S. WOLF ROAD, DES PLAINES, ILLINOIS

Encircle No. 370 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



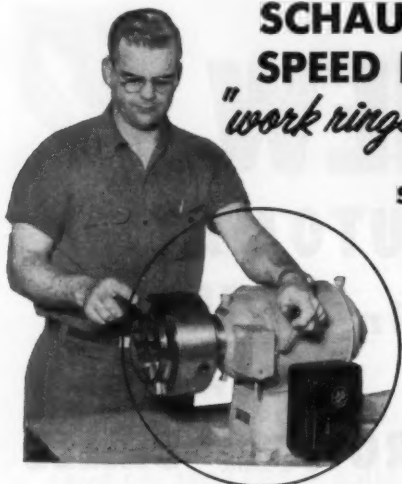
Quick stopping feature eliminates the delay in returning the drill to its original position. Drill has automatic for-

ward and reverse movement of the drill spindle; there is a constant bath of oil to all moving parts. The drill unit can be mounted in any angle or plane; available in capacities from No. 50 to 5/16". Simplex Tool Eng. Co., Dept. B, 2540 Park Ave., Detroit 1, Mich.

Use ACTION Card, opposite page 64. Encircle No. 94

Sensitive tap tool

A tap tool for high speed, super sensitive tapping of 0-80 to 4-40 holes in



SCHAUER SPEED LATHES *"work rings around"*

OTHER
SECONDARY
FINISHING
METHODS

Stoning hardened
steel ring with
Schauer Type NA2B
Speed Lathe.

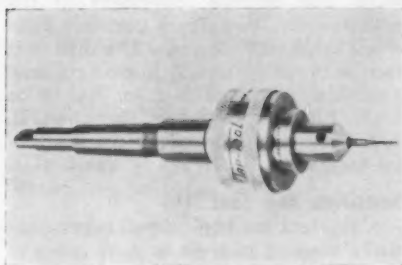
These versatile, low-cost machines provide the fastest, most economical method of filing, deburring, polishing or lapping metal and plastic parts. There's a Schauer Speed Lathe to solve practically any secondary finishing problem. Many sizes and models with holding devices to suit the job. *Speed your production* with Schauer Speed Lathes. Write for Catalog No. 530.

See Schauer Speed Lathes at the Production Engineering Show, Booth No. 245, Navy Pier, Chicago, September 6-16.

SCHAUER MANUFACTURING CORP.

4502 Alpine Ave. • Cincinnati 36, Ohio

Encircle No. 371 on Card, Opposite Page 65



steel and other metals and plastics has been placed in production by Armite Laboratories, Dept. B, 6609 Broad St., Los Angeles 1, Calif.

It consists of a Morse No. 2 tapered shank with a telescoping spindle which provides for vertical travel of the tap, a knurled control collar to provide maximum "feel" of the tapping operation, and a lock screw arrangement which engages an overload clutch for



NEW

AUTOMATION in DRILLING at Low Cost



ARO Automatic and Par-A-Matic DRILLS

Increased production . . . higher quality . . . fewer man hours! Controlled air and hydraulic feed . . . rapid traverse adjustment . . . adjustable stroke length . . . use singly or in combinations. Write for bulletin 5546-T on Automatic and Par-A-Matic Drills.

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Bryan and Cleveland, Ohio

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® Offices in All Principal Cities

ARO

AIR TOOLS

Also . . . Air Hoists . . . Lubricating Equipment . . . Aircraft Products . . . Grease Fittings

Encircle No. 372 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

small taps and disengages for No. 2 and No. 4 taps. The control collar is held in hand of operator and a light downward pressure applied to the collar drives the tap into the work while a light upward pressure reverses it. During tapping operation the tap can be cleared as necessary by the reverse control. The head is adaptable for through or bottom tapped holes.

Use ACTION Card, opposite page 64. Encircle No. 74

Say Hello!

The editors of the MACHINE and TOOL BLUE BOOK cordially invite you to visit their booth, No. 121, at the National Tool Show, International Amphitheatre, Chicago, Sept. 6-17.



You can cut your own keyways by hand, with an arbor press, in *one minute* for as little as *one cent*. Do it the *easy* way with a du MONT *Minute Man* Keyway Broach Kit. For keyways from $\frac{1}{16}$ " to 1" in any bore from $\frac{1}{4}$ " to 3".

SAVE ON BROACHING SQUARE HOLES

Minute Man High Speed Steel Square Broaches finish cast or drilled holes much more accurately and far cheaper than by hand. For $\frac{1}{16}$ " to $\frac{3}{4}$ " squares.



The du MONT CORPORATION, Greenfield, Mass.

MAIL FREE BROACH CATALOG AND PRICE LIST T describing 25 standard kits, 23 standard broach sizes, 71 bushing sizes, square broaches and a wide range of SPECIAL BROACHES to

Name

Company

Address

Balancing Tools for a Wide Range of Work



Here's a complete line of Balancing Tools which will save their cost quickly on balancing or truing operations. Accurately sensitive and durable, they provide a simple, reliable means for checking the balance of parts like gears, shafts, fly wheels, pulleys, etc. The standard sizes available are shown in capacity chart below.

CAPACITIES

Swing	Between Standards	Weight Capacity
21 in.	20 in.	12 lbs.
21 in.	20 in.	800 lbs.
43 in.	29 in.	800 lbs.
43 in.	29 in.	2,000 lbs.
6 ft.	5 ft.	5,000 lbs.
8 ft.	8 ft.	10,000 lbs.
Any	Any	24,000 lbs.
43 in.	30 in.	800 lbs.

FREE DATA



You can obtain complete information on Sundstrand Balancing Tools by writing for bulletin 458.



SUNDSTRAND MACHINE TOOL CO.
2535 Eleventh Street, Rockford, Ill., U.S.A.

Encircle No. 374 on Card, Opposite Page 65
246

Save Costly Regrinding!

Anderson NEW, IMPROVED HAND SCRAPER

After the original regrinding most users of this new Anderson hand scraper find that only honing is necessary. Judge for yourself: Order as many Model 5-D scrapers as you want. We'll send them promptly. Use them a full week... if they don't live up to all your expectations, send them back to us for refund.

Faster Cutting
Easier to Use
Just the Right Spring
Palm Fitting Grip
Light in Weight
18" — 20" — 22" lengths

\$5.80... with high speed steel blades

\$8.50... with carbide-tipped blades

\$1.50... for rubber bumper shown below

ORDER AS MANY AS YOU NEED MONEY-BACK GUARANTEE

Indicate choice of high-speed steel or carbide-tipped blades, and 18", 20", or 22" lengths. We suggest you include rubber bumpers in your order. Write today

For Bulletin No. 7-5

**ANDERSON
BROS. MFG. CO.**
1907 Kishwaukee St.
ROCKFORD
ILLINOIS

Encircle No. 375 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

Exhaust valve increases speed of air cylinders

The Quick Exhaust valve developed by Air-Mite Devices, Inc., Dept. MTB, 4417 W. Carroll Ave., Chicago, is claimed to increase the efficiency and operating speed of air cylinders by providing



fast venting of air from the return side.

Faster return strokes and more strokes per minute result when the valve is connected into the circuit. Compact design and construction permit installation at the cylinder inlet. Valve is available with $\frac{3}{8}$ " pipe ports.

Use ACTION Card, opposite page 64. Encircle No. 54

Dial feed press is air operated

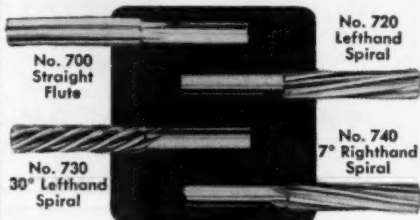
A precision dial feed press for high speed production marking has been announced by the Noble & Westbrook Mfg. Co., Dept. BB, East Hartford, Conn. Known as the Model 400, press is air operated and electronically controlled, and will produce serial numbered workpieces at the rate of 2500 parts per hour.

An electro-pneumatic circuit provides continuous automatic cycling at any speed to suit the operator. Loading

SUPEREAM *the only* DECIMAL REAMER

with all Flutes ground Face and Back after heat treatment . . . preventing

Clogging or Freezing of chips for REMARKABLE SMOOTH REAMING



WHY BUY a decimal reamer as a special when you can buy a SUPEREAM decimal reamer from STOCK for immediate delivery!

SAVE TIME — SAVE MONEY—

GARBERDING FINGER STOPS



Made in uniform width to fit any standard width slots. Simply grind ends to fit.

PHONE LIBERTYVILLE 2-4200

TWENTIETH CENTURY
MANUFACTURING CO.

ROUTE 176 and BRADLEY ROAD
BOX 429 LIBERTYVILLE, ILL.





time and marking dwell can be varied independently as required. The circuit also includes supplementary controls for semi-automatic operation from a foot switch and independent operation of press head and dial feed for setup purposes. The machine can also be used for crimping, staking, forming, riveting, etc., and larger models are available for heavy duty work.

Use ACTION Card, opposite page 64. Encircle No. 55

Automatic lubrication unit serves up to 1000 bearing inches

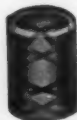
A new, large-capacity bearing lubrication unit of the oil fog type offers unique automatic control features.

It has 4½ gallon oil capacity and uses twin lubricator heads which may be used simultaneously or individually depending on fog requirements for the specific application. The fine Micro-Fog generated can be carried great distances with a minimum of precipitation in the lines and can be uniformly



Write for Catalog.

Send parts for free grooving and production estimate



Fischer . . . OIL GROOVERS

The FISCHER No. 1 Oil Groover cuts a wide variety of grooves in bearings up to 8" in length and up to 5" inside diameter. A few simple settings permit you to cut continuous, relieved, straight or spiral grooves at any angle from parallel to perpendicular to the work. Grooves may also be cut in shafts, housings, etc.

This machine will slash grooving time and deliver continuous profitable production in your shop. It will pay to find out what it can do on your grooving jobs.

ESTABLISHED 1900

FISCHER MACHINE CO.

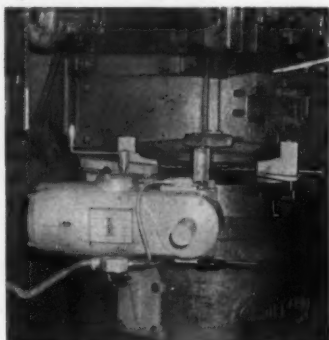
ELEVENTH and WOOD STREETS — PHILADELPHIA 7, PA.

Encircle No. 377 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK



"VERTICAL TURRET LATHE APPLICATION"



Illustrated above is a Model 12M Fen Automatic Wrench operating a 36" chuck on a Plain Vertical Turret Lathe.

The Fen Automatic Wrench with a right angle drive has proven to increase production and reduce worker fatigue on the Plain, as well as the Single and Double Indexing Vertical Turret Lathes. The Fen Automatic Wrench with a right angle drive is available in torques up to 12,000 inch lbs.

For detailed information regarding the application of the Fen Automatic Wrench to your machines, phone, wire or write.

THE **FEN**

MACHINE COMPANY
28915 LAKELAND BLVD.
WICKLIFFE, OHIO

Encircle No. 378 on Card, Opposite Page 65



distributed to multiple bearing lubrication points having a maximum total of 1000 bearing inches, the manufacturer claims. Unit measures only 27" x 12½" x 16½". Three 2" fog outlets provide for flexibility of installation. The unit

model number is 33AB-4.

Features include: 360° visibility of oil feed, visible oil supply; incoming air is filtered, with collected moisture automatically drained; continuous control of oil fog output; electrical connections centrally located in a water-tight junction box; terminals and wiring identified; air requirements are variable depending upon oil fog output, maximum 27 cfm, at 60 psi. operating pressure. C. A. Norgren Co., 3438 S. Elati St., Englewood, Colo.

Use ACTION Card, opposite page 64. Encircle No. 56

Live center for smaller lathes

This small live center is designed for heavy as well as lighter duty. It has a ball radial bearing that does not take thrust load, a heavy duty ball thrust bearing and a long-wearing Oilite bronze bearing at upper end of spindle. Spindle is hardened and ground chrome steel and comes for Morse tapers No. 2 and

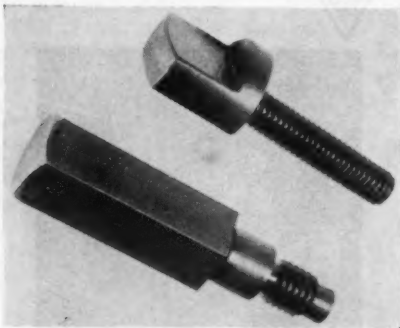


No. 3. Diameter of head for the No. 2 is 1½" and for the No. 3 is 1¾". Motor Tool Mfg. Co., Dept. B, P. O. Box 3805, Detroit 5, Mich.

Use ACTION Card, opposite page 64. Encircle No. 57

Jig legs and half turn screws

These two new parts have been announced by West Point Mfg. Co., Dept. B, 26935 W. 7 Mile Rd., Detroit 19, Mich.



Four jig legs added to a plate provide the framework of a plate jig. Half turn screws were designed for use where it is impractical to use quarter turn screws.

Use ACTION Card, opposite page 64. Encircle No. 58



THESE ENDS WITH ONE STROKE OF PUNCH PRESS

ARC-FIT TWIN NOTCH

NO DEFORMATION Shears from inside out—cuts clean edges; eliminates need for further finishing; aligns notches automatically.

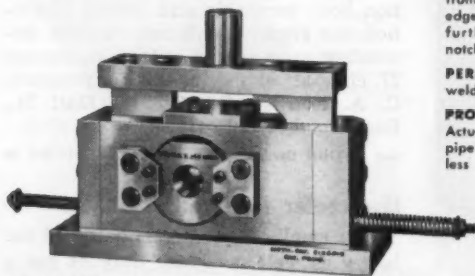
PERFECT "T" Joints for welding or brazing.

PRODUCTION NOTCHING Actual production time per pipe or tube end reduced to less than 3 seconds.

INTERCHANGEABLE

Punches and dies up to 2½" O.D. pipe or tube for STANDARD TWIN NOTCH.

(Special units available up to 3" O.D.)



PATENT PENDING

VOGEL TOOL AND DIE CORPORATION

1825 N. 32nd Ave. Melrose Park, Illinois
Pillmore 5-0160



SEND FOR
DESCRIPTIVE
LITERATURE

WALTHAM CYLINDRICAL SUB-PRESSES

Dies for high precision work should not only be perfectly aligned but provision should be made to maintain that alignment throughout the life of the die. Our bulletin shows how it can be done.



ARCH SUB-PRESS

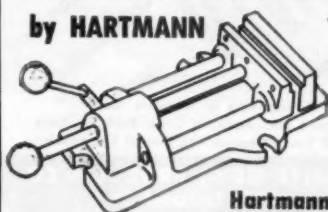
WALTHAM MACHINE WORKS WALTHAM 54, MASS.

Encircle No. 380 on Card, Opposite Page 65

INSTANT ACTION RAPIDSET

by HARTMANN

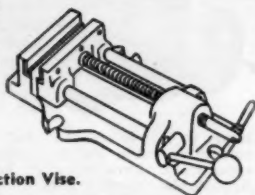
All Purpose Tool Room and Machine Shop Vises.



The JAWSET

Adjustable Pressure Production Vise.

For Information Write Dept. M

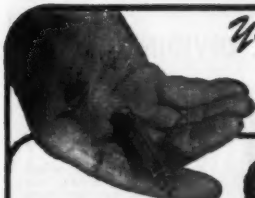


Hartmann Mfg. Co., 1637 Goold St., Racine, Wisconsin

Encircle No. 381 on Card, Opposite Page 65

*You Need an Extra Hand Now
to Speed Up Production!*

HEIMANN TRANSFER SCREW SETS



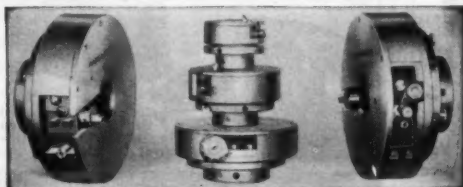
IN 11 SIZES—No. 6 to 1"
N.C. in all S.A.E. sizes.



Here is the faster, more precise way of transferring open and blind screw holes—make savings in "wage-dollars-per hour" of your expensive hands on every job. A die-and-tool maker's tool with many other applications for die makers and machinists. A set of 6 Hardened Screws nested in combination holder and wrench—no other tools needed. Get more work now—save money too!

HEIMANN MFG., CO. • URBANA, OHIO

Encircle No. 382 on Card, Opposite Page 65



MUMMERT-DIXON FACING HEADS with Automatic Feed

One-way Tool Feed—6, 9 and 10" sizes.

Two-way Tool Feed—9, 12, 16, 20, 24, 30, 36, 40 and 46" sizes.
Save many costly set-ups.

Bulletin No. 4141 Gives Full Details

MUMMERT-DIXON CO., 122 Philadelphia St., Hanover, Pa.

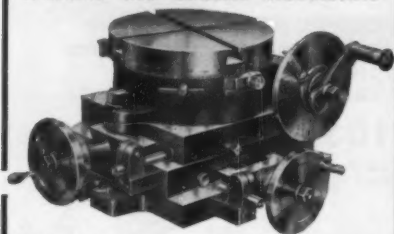
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The **STEVENS** Line

SINCE 1925

Showing 7½" Dial Type Rotary
Table Mounted on compound
table No. 1

Traverse and Circular Movements-



Made in larger size 12" dial type Rotary-compound table No. 2. Either unit usable separately. Five sizes of Rotary Tables. Adjustable tilting tables. Multiple spindle index centers. Screw head sloters. Vises.

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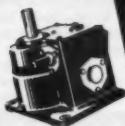
The JOHN B. STEVENS Company
SOMERSVILLE, CONN.

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Abart IMPROVES EQUIPMENT PERFORMANCE

SPEED REDUCERS

Over 75 types and sizes for
all applications. Ratings
from 1/50 to 417 hp. Ra-
tios from 2-1 to 10,000-1.



GEARS

Precision cut to your specs
from any material. 5/7 to
96 D.P.—Spur, Helical,
Worm, Bevel and
Spiral Bevel.
¼" to 18" P.D.



Get full data in
Abart's pocket-size catalog. Your
copy of this helpful, technical
handbook FREE on request.

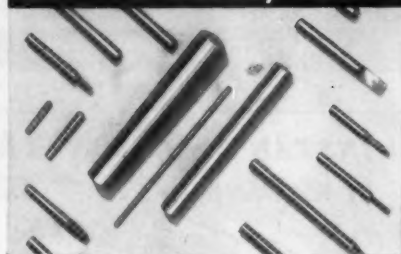
ABART GEAR & MACHINE CO.

4829 West 16th Street • Chicago 50, Illinois

Encircle No. 385 on Card, Opposite Page 65

252

Peaslee DOWELS, PINS, SHAFTS, ETC.

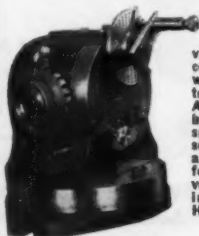


Specializing in Stainless Steel
Standard and Made to Order Precision Parts
Send Your Blueprints for Prompt Quotations

PEASLEE METAL PRODUCTS CO.
470 Tolland St.
EAST HARTFORD, CONN.

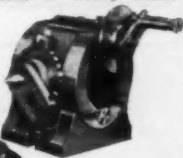
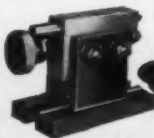
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UNIVERSAL DIVIDING HEADS



Precision built to
meet every require-
ment. Carroll Div-
iding Heads are the ac-
cepted standard in metal-
working plants from coast
to coast.
A unique optional swivel
base makes possible
speedy and accurate work
settings to compound
angles. This and other
features convert a con-
ventional Dividing Head
into a Universal Work
Head or Rotary Table.

Write for 8 page catalog
giving complete details,
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10" - 12" Universal
Right or Left Hand
Dividing Heads with or with-
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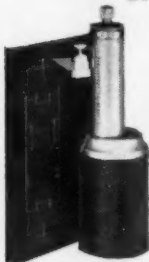
CARROLL DIVIDING HEAD CO.

3525 Cardiff Ave. • Cincinnati 9, Ohio

Encircle No. 387 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

MICRO-HEIGHT GAUGE

BY FAIRFIELD GAUGE CO.



**NO OTHER GAUGE
COMPARES FOR
FAST, ACCURATE
LAYOUT AND
MEASURING**

Capacities to
6" when used
with this
Fairfield Gauge
3" Riser

The Micro-Height Gauge is a precision instrument, finished in satin chrome, which reads like a micrometer and measures from zero at base to 3" in thousandths. Use as a scribe for fast layout, or insert dial indicator for quick, accurate inspection.

Exclusive distributor for U.S. and Canada:

FAIRFIELD GAUGE COMPANY

172 Herbert St., Bridgeport, Conn.

Encircle No. 388 on Card, Opposite Page 65

**Micro
Supreme**

**LAY-OUT AND
IDENTIFICATION DYE**

7 COLORS

For Tool, Die, Pattern or Template layout on metal . . . Quick identification of bar stock, sheets, strips or parts . . . Shows up in sharp relief—dries instantly . . . Write for sample and circular on company letterhead.

**MICHIGAN CHROME &
CHEMICAL COMPANY**

8615 Grinnell Ave. • Detroit 13, Mich.

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July, 1955

NIELSEN Heavy Duty

*Live
Centers*

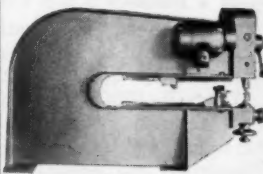
Write for
catalog on
live centers

Adapted
for heavy
duty work.
Precision type
ball and roller
bearings assure
maximum capac-
ity for high speed
production and long
service.

NIELSEN, INC. LAWTON,
MICH.

Encircle No. 390 on Card, Opposite Page 65

G. V. METAL WORKER



285A

Capacities
MODELS
285-A
1/8 inches
400-A
15/64 inches
490-A
5/16 inches

The Multi-Purpose Machine

For use in Straight, Circle, and Free Cut-
ting, Beading, Offsetting, Forming, Nib-
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Shrinking, Etc.

TECH-PACIFIC
2811 LAFAYETTE

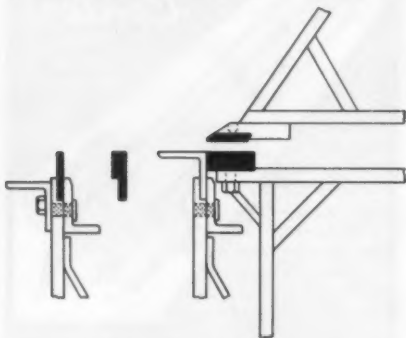
NEWPORT BEACH, CALIFORNIA

For
literature
or
information
write:

Encircle No. 391 on Card, Opposite Page 65
253

Hard inserts added to hand brakes

Dreis & Krump Mfg. Co., Dept. B, 7400 S. Loomis Blvd., Chicago 36, has announced a change in design of all models of its line of standard hand brakes and universal box and pan



brakes to incorporate hard inserts for bending leaf bars and also for the top nose bar and bottom bar.

It is claimed that these inserts increase the life of the bending edges. They are easily removed and replaced.

Use ACTION Card, opposite page 64. Encircle No. 67

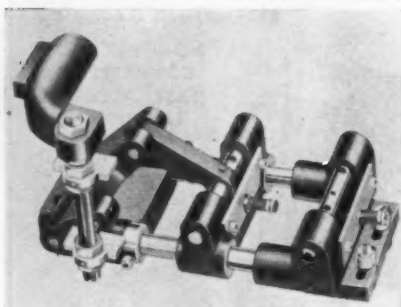
Hitch feed handles stock widths of 3 inches

An automatic Surefeed to handle maximum stock widths of three inches has been introduced by the Producto Machine Co., Dept. B, 990 Housatonic Ave., Bridgeport, Conn.

All wearing parts of this hitch feed are made of hardened and ground tool steel. The adjustable feed gripper plates can be reversed to give longer life.

The hitch feed can be mounted right on the die set so that the two units can be handled as one. No press or feed alterations are required when mounting in any ordinary press.

Only two drive plates and simple linkage, controlled by the movement of the press, are used to advance the stock. Stock thicknesses of .005" to .055" are handled. Feed length for presses



having 1" stroke is .000 to 7/8"; for presses having 1 1/2" or more strokes, .000 to 3".

Use ACTION Card, opposite page 64. Encircle No. 68

Air impact wrench

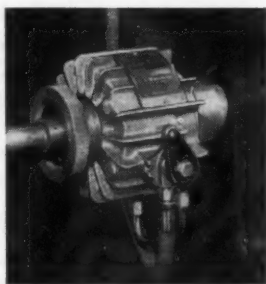
A new lightweight impact wrench, the J-4S, with a 3/8" bolt capacity, has been announced by the Rotor Tool Co., Dept. B, 26300 Lakeland Blvd., Cleveland 23, Ohio.

The tool has a direct drive air motor



giving 1800 impacts per minute. A 5/8" square drive is standard with optional 1/2" square drive or 7/16" female hex quick change chuck.

Use ACTION Card, opposite page 64. Encircle No. 69



AIR-CONTROLLED COLLET CLOSER

Designed to replace hand levers and hand wheels on collets for engine and turret lathes of one-inch bar stock capacity. Finger-tip or foot control increases production 20% or more.

(Ten days FREE TRIAL to reliable firms)

WILSON AIR COLLET CLOSER, INC.
909 40th Ave. NE, Minneapolis 21, Minn.

Encircle No. 392 on Card, Opposite Page 65

TAMMS
Blue Layout
Dope
won't chip, crack or
flake off!



Drys fast! Oil resistant!
Best dope you ever used!

WRITE FOR
SAMPLE!

Tamms Industries, Inc.
228 N. La Salle St. • Chicago, Ill.

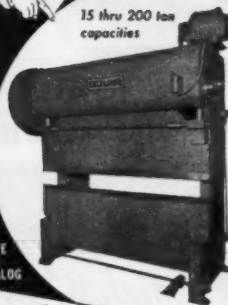
Encircle No. 393 on Card, Opposite Page 65
July, 1955

MODERN IN DESIGN...VERSATILE IN PERFORMANCE!



Excelsior ALL STEEL PRESS BRAKES

15 thru 200 ton
capacities



- DURABLE
- RUGGED
- DEPENDABLE

Excelsior products have been proved by over a half century, of continuous trouble-free service on the production line.

WRITE
FOR
CATALOG

Excelsior TOOL & MACHINE CO.
RIDGE AVE. and 31st. EAST ST. LOUIS, ILL.

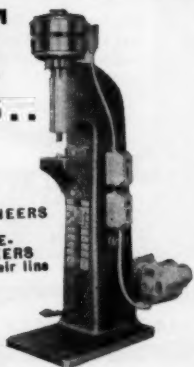
Makers of Precision Machinery for the Metal Working Industry Since 1892

Encircle No. 394 on Card, Opposite Page 65

GRANT RIVETERS..



PIONEERS
and
PACE-
MAKERS
in their line



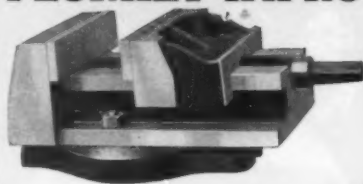
—head rivets from smallest to 1/2" diameter either by NOISELESS SPINNING or VIBRATING HAMMER method—sizes to meet all needs—types include Vertical and Horizontal Multiple Spindles.

Write for literature and don't forget to send samples

THE GRANT MFG. & MACHINE CO.
CE Station Bridgeport 5, Conn.

Encircle No. 395 on Card, Opposite Page 65

PLUNKET IMPROVED VISES



We make a complete line of modern vises for drill presses, shapers, milling machines and grinders. Illustration shows our standard milling machine vise as regularly furnished and stocked. Best material and workmanship. Prices are net f.o.b. Chicago. Dealer's inquiries are solicited.

In ordering this vise give size of slot in table:
No. 10—6", 1 1/2" deep, opens 3"
wt. 45 lbs. \$ 81.84
No. 20—10" jaws, 2 1/4" deep, opens 8 1/2"
wt. 120 lbs. \$110.88

Write for folder TODAY.

J. E. Plunket Machine Co. 3230-32 Archer Ave.
Chicago 6, Ill.

Encircle No. 396 on Card, Opposite Page 65

... the Quality Line

STEEL
Stanho
PRODUCTS

Stainless Steel
TAPER PINS

Complete stock, all sizes #7/0 through #14.
Special sizes to order.
Milled or Centerless Ground (Precision Type)
Made to accurate tolerances.

Also "Stanho" Taper Pins made from selected screw stock, Monel, Brass, Aluminum or other metals. Clean bright finish—prompt shipments.

Write for description and prices.

STANDARD
HORSE NAIL CORP.
1872 NEW BRITAIN, PA.

Encircle No. 397 on Card, Opposite Page 65

**CONVERTIBLE
BUILT-UP
SNAP
GAGE**

**A
NEW
IDEA**

TO CUT GAGE LABOR COSTS

Now your gage makers can save time by eliminating all labor except the grinding of the spacer block... with resulting savings to you. Low in cost, these units will pay for themselves many, many times in your plant. Supplied with high speed steel anvils, hardened and ground.

Size A	0—.187 In.	\$3.32
Size B	.187—.531 In.	\$3.82
Size C	.531—1.093 In.	\$5.60
Size D	1.093—1.968 In.	\$6.48

Price based on order of six or more. Other quotations on request. Write for full details. Patent Pending

MECHANICAL PRODUCTS CO.
30 MANHAN ST., WATERBURY, CONN.

Encircle No. 398 on Card, Opposite Page 65

The
"MASTER COMPAR"

INDICATING MICROMETER COMPARATOR

has the **VISIBLE** feel

No Arguments as to correctness of reading due to "feel". Use it as Comparator, Master Micrometer, Go & No Go Gage. 1" Range reading in 1/10,000"

A RIGHT HAND TOOL
Release button for movable Anvils on RIGHT Hand side enables you to hold tool the conventional way.
NEW—Resetting to Zero in 5 seconds
Quick adjustable tolerance bands. Heavy TUNGSTEN CARBIDE Anvils will actually measure Out-of-Roundness, Ovalness and Taper.

0-1" SIZE IN HARDWOOD CASE
\$95⁰⁰

Also Available in LARGER SIZES

Ask for Illustrated Circular — Code GIOFF Sold thru Tool Supply Houses
GEORGE SCHERR CO., INC. Ask for Demonstration
200-MT LAFAYETTE STREET • NEW YORK 12, N.Y.

Milling chuck prevents slippage of cutters

The Jahrl milling chuck is claimed to provide a method of holding milling cutters with cylindrical shanks so that they do not slip or draw out of the chuck. The inner taper of the nose does not rotate against the matching taper of the collet. This feature reportedly avoids loss of constrictive power and increases the clamping effect.

The clamping nut of the Jal milling chuck as it is commonly called, is provided with a ball bearing in order to reduce friction when tightening the chuck and to clamp the tool more securely. The collet is not submitted to any radial force while the chuck is being tightened, as the collet nose moves only axially on a cylindrical guide.

The collet is made with a locking taper, which is released automatically when the clamping nut is turned



counter-clockwise one revolution. J & S Tool Co., Inc., Dept. BB, 650 W. Mt. Pleasant Ave., Livingston, N.J.

Use ACTION Card, opposite page 64. Encircle No. 70

Commander TAPPER

- Wider Range . . . 1 Tapper Handles No. 0 to 3/4" Taps
- Automatic Tap Protection
- Furnished to fit ANY Drill Press

Commander—"The Tapper That Thinks For Its Operator," has the adjustable full range torque control that instantly stops any tap when it becomes dull, loaded, strikes a hard spot or bottoms in blind hole tapping. Assures maximum tap protection, higher production, even with inexperienced operators.

Your nearby Commander Distributor can give you a demonstration in your own plant. Write for his name and a copy of the NEW Commander Full Line.

COMMANDER MFG. CO.
4227 W. KINZIE STREET CHICAGO 24, ILL.
Product of Commander . . . Builder of Production Tools



Any operator
does precision
tapping with
a *Commander*
TAPPER

Product of *Commander* . . . Builder of the *Multi-Drill*

Most Exciting Event

The metalworking industry is anxiously awaiting the year's most exciting event: the three Chicago shows to be held simultaneously, September 6-17. Plan now to attend. The National Machine Tool Show (which will be located at the International Amphitheatre) and the Production Engineering Show (Navy Pier) are being sponsored by the National Machine Tool Builders' Association. Exhibition & Convention Management, Inc. will manage the Coliseum Machinery Show (Coliseum).

Save your large
JIG BORERS
for large jobs . . .
put small precision
work on the
LINLEY

The Linley Jig Borer provides the means . . . at very low cost . . . of handling your most exacting requirements in precision. With it you can cut costs through having a tool exactly fitted to your small work . . . save your larger machines for larger work.



SPECIFICATIONS

Table Movement: 6"x10" Table Size: 7"x17 1/2"

Send for complete information TODAY!

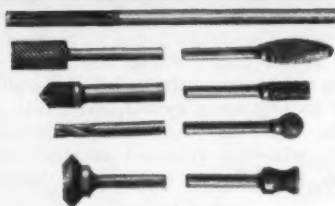
LINLEY BROTHERS CO.

663 State St. Ext. Bridgeport 1, Conn.

Encircle No. 401 on Card, Opposite Page 65

ESSEX
Precision

**CARBIDE &
HIGH SPEED
CUTTING TOOLS**



CARBIDE TOOLS:

Burrs
End Mills
Reamers
Burr Sets
Special Tools

HIGH SPEED STEEL TOOLS:

Rotary Burrs
Rotary Files
Chatterless
Countersinks
Special Tools

All U.S. Steel & Carbide Tools salvaged and resharpened
(Write for catalogue)

ESSEX ROTARY FILE & TOOL CORP.

Makers of Fine Tools Since 1888

295 MADISON AVE.

NEW YORK 17, N. Y.

Encircle No. 402 on Card, Opposite Page 65

OPEN

CLOSED

TRADE

AUTOM

MARK

CLOSED

OPEN

Plain Type

CONTINUOUS HINGES

Offset Type

All hinges shown can be furnished with special holes, cutouts and bends to blue-print in metals to suit the job.

**THREE-FOURTHS
OFFSET**

**AUTO MOULDING
& MFG. CO.**

**1110 E. 87TH ST.
CHICAGO 19, ILL.**

SPECIFICATIONS

Open width 7/8" to 6"

Gage Material .040 to .125

Pin Diameter .101 to 3/8"

Lengths to 120"

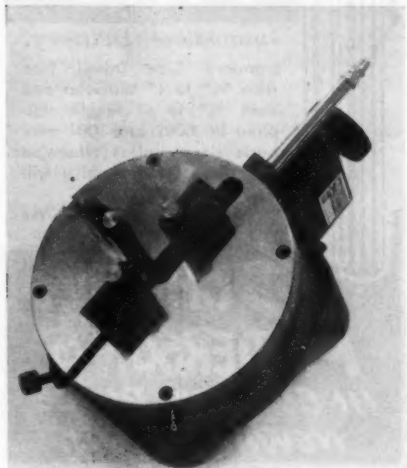
SEMI-OFFSET

Encircle No. 403 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

Bench type internal-external diameter gage

Model K 4R bench comparator checks inside or outside diameters. The built-



in Acrament system of adjustment with .010 range and high fidelity of this gage is claimed to provide control and accuracy required for its use with mechanical indicator or air-probe type of gaging. The same bracket will accommodate any AGD standard indicator or air-probe.

The standard jaws provided with this gage are adjustable for up to 1/4" height of measurement setting. Range with standard jaws is max. od 5", max. id 5"; min. od 7/16", min. id 1/8".

Use ACTION Card, opposite page 64. Encircle No. 71

Truing attachment ends trial and error

The Sanford Mfg. Corp., 1020A Commerce Ave., Union, N.J., has announced a precision attachment with which any lathe chuck, face plate or special fixture can be used to provide concentricity. Workpiece tolerance to within .0001" total indicator runout is claimed.

The Sanford Auto-Truer is said to

The machine shown here was built by Rehnberg-Jacobson, to perform a series of drilling, tapping, and reaming operations.



MAKE IT YOURSELF?

You can do it with **R-J UNITS**

Rehnberg-Jacobson ALL-MECHANICAL Drill, Tap, and Index Units are specially designed for YOU to use for making up YOUR OWN special-purpose machines — or for adding to or modifying some of the special-purpose (or standard) machines you now have. They are accurate, efficient, economical — and available in enough models and sizes to suit most every need. WRITE TODAY for Data Sheets giving complete engineering information.

TAP UNITS, for example, are made in four capacities from 5/16 - 18 and 1-1/4" stroke to 1-1/2 - 6 and 4-1/2" stroke. They are self-contained, with lead screw feed.



REHNBERG-JACOBSON MFG. COMPANY

2135 KISHWAUKEE ST., ROCKFORD, ILLINOIS

YOST DRILL PRESS VISE



This new Yost vise has been designed expressly for use on drill press operations. Does away with special and costly jig fixtures.

Offered in two sizes.

Vise No.	Width of Jaw, inches	Opens inches	Weight Pounds
1D	3 1/2	3 1/2	12 1/2
2D	5	5 1/2	23

Do you need a vise of ANY type?

Write today for bulletins on the extensive Yost line

YOST MFG. COMPANY
1335 SO. MAIN STREET
MEADVILLE, PENNSYLVANIA

Encircle No. 405 on Card, Opposite Page 65

Over 85% of the torque wrenches used in industry are

STURTEVANT TORQUE WRENCHES

Read by Sight, Sound or Feel

- Permanently Accurate
- Practically Indestructible
- Faster—Easier to use
- Automatic Release
- All Capacities

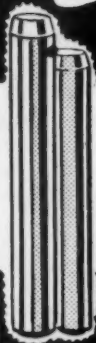
in inch grams
...inch ounces
...inch pounds
...foot pounds



Every manufacturer, designer and production man should have this valuable data. Sent upon request.

Encircle No. 406 on Card, Opposite Page 65
260

DOWEL PINS



Immediate Delivery!

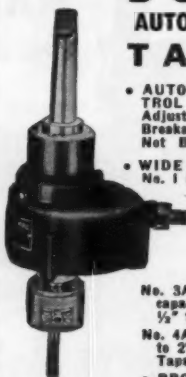
Standard Size Dowel Pins from 1/8" to 1" diameter and from 3/8" to 6" length supplied in .0002 and .001 over basic sizes. Unless otherwise specified, .0002 oversize will be furnished.

Dealer's Inquiries Invited.

SCHULTZ & ANDERSON CO
111 EDISON PLACE,
NEWARK 5, N.J.

Encircle No. 407 on Card, Opposite Page 65

DORMAN AUTOMATIC REVERSE TAPPERS



- AUTOMATIC TORQUE CONTROL . . . One Minute to Adjust . . . Prevents Tap Breakage . . . Operator Need Not Be Skilled.

- WIDE RANGE TAP CAPACITY No. 1 FRICTION DRIVE TAPPER

—Capacity No. 2—5/8 to 3/4" in Steel
1/2" in Aluminum.
No. 2B POSITIVE TAPPER—capacity 3/4" to 1/2" in Steel

No. 3A POSITIVE TAPPER—capacity 1/2" to 1 1/4" in Steel.
1/2" to 3/4" Pipe Taps.

No. 4A TAPPER—Capacity 3/4" to 2" in Steel including Pipe Taps.

- PRODUCTION THREADERS with Round Split . . . Button . . . Acorn Dies

- IMMEDIATE DELIVERY

Price from \$50.00. Write for Bulletin.

THRIFTMASTER PRODUCTS CORPORATION

Division of Thomson Industries, Inc.

1030 N. PLUM STREET, LANCASTER, PA.

STANDARD UNIVERSAL ADJUSTABLE AND SPECIAL-FIXED CENTER DRILLHEADS

Encircle No. 408 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK

eliminate trial and error in the truing process. The device is mounted on the lathe spindle, then the lathe chuck, face plate or special fixture is mounted upon the Auto-Truer.

The workpiece is trued by bringing pressure against it with a follower while the lathe is running. This pressure causes the unit to shift its center until true center is indicated. The lathe is stopped and the Auto-Truer is locked into position.

Use ACTION Card, opposite page 64. Encircle No. 72

Speed button balancer

The Taylor Dynamometer & Machine Co., Dept. B, 6411 River Parkway, Milwaukee, Wis., is in production on a new "SB" series of balancing machines.

Speed button control replaces the hand-operated lever ordinarily used to operate the balancing machine. Two push-buttons activate a pneumatically operated lifting device to balance the piece part involved.



To operate the equipment the "balance" button is pressed. The amount and location of unbalance can be read immediately. By pressing the "off" button, the equipment returns to inoperative position, ready for the next part to be balanced.

Use ACTION Card, opposite page 64. Encircle No. 73

SAVE YOUR CIRCULAR SAWS!



WARDWELL NO. 57T AUTOMATIC CIRCULAR SAW GRINDER PAYS FOR ITSELF MANY TIMES OVER

As many as 250 Milling Cutters, Slitting and Screw Slitting Saws .015" thick can be sharpened at one time with a variation, plus or minus .001" of exact diameter for entire lot.

Automatically indexes the gang of saws, one row of teeth at a time.

Steady, accurate, durable. Grind either wet or dry. A time and money saver.

Ask for Bulletin describing 57T



WARDWELL

MANUFACTURING CO.

3807 Ridge Rd., Cleveland 9, Ohio

Maker of Largest Line of Saw and Tool Sharpening Machines



We specialize in large size ring gages. Write for newly revised catalog.

ALL FE GAGES are

Made by skilled workmen from highest quality material. Constant size and continued accuracy are assured by sub-zero treatment. Each gage rigidly inspected.

Emergency situations in your plant solved by our unusually prompt delivery.

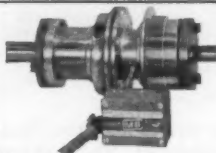


THE FARMINGTON ENGINEERING CO.

72 Granby St.

Bloomfield, Conn.

Encircle No. 410 on Card, Opposite Page 65



Transmission Type

RLH CONSTANT TORQUE COUPLINGS with AUTOMATIC COMPENSATION for Friction Variation

WRITE FOR BULLETINS



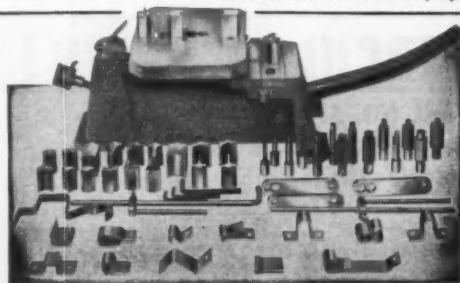
Spindle Type

Torque settings unaffected by normal variations in co-efficient of friction. Breakaway torque and running torque become truly constant.

SPECIAL SHANKS FURNISHED TO ACCOMMODATE INDIVIDUAL APPLICATIONS

BUFFALO MACHINERY CO., Inc. 835 GRANT STREET BUFFALO 13, N. Y.

Encircle No. 411 on Card, Opposite Page 65



Multiform BENDER-CUTTER

CUTS, BENDS, PUNCHES

Available in hand or air operated models, the MULTIFORM is shipped complete with full assortment of dies and mandrels to punch, bend and cut round or flat brass, bronze, aluminum, steel, etc., up to $\frac{1}{2}$ " x $\frac{1}{2}$ " as illustrated, other models up to $\frac{1}{2}$ " x 4".

J. A. RICHARDS CO.
KALAMAZOO, MICH.

Encircle No. 412 on Card, Opposite Page 65



for nut countersinking

Two KENT machines are available—the smaller for nuts up to $\frac{3}{4}$ " hexagon—the larger for nuts up to 1-7/16" hexagon.

Hopper fed. Duplicate work spindles countersink both sides of nuts simultaneously giving fast, economical production.

Write for bulletin.

The KENT MACHINE COMPANY
Cuyahoga Falls, O.

Drillers - Threaders - Slotters - Countersinkers
Bar Pointers

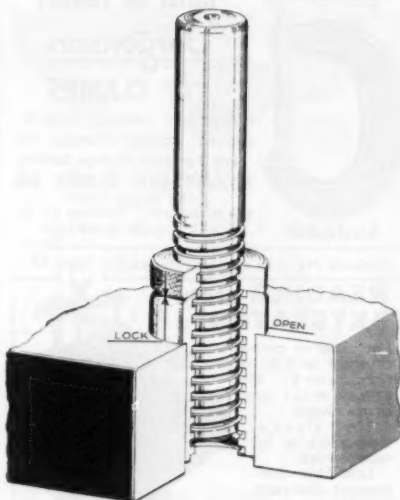
Encircle No. 413 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

Removable guide pin

A removable guide pin that permits variable adjustment to the shut height of the die has been announced by Superior Steel Products Corp., 2754 S. 19th St., Dept. B, Milwaukee, Wis. Known as the Spira-Lock, the pin is designed with a special threaded end to fit a threaded bushing. Adjustment to the die shut height is obtained by screwing the pin into the bushing to the desired height. With the pin at the proper height, it is pressed or driven down until the thread of the pin is press fit into the bushing thread. A lock nut on the top of the bushing assures retention of the press fit at all times.

Removal of the pin is accomplished by releasing the lock nut, driving the pin down until the threads are once more in line, and unscrewing the pin. Removal is possible in the press without the necessity of turning over the die shoe.



The pin, in addition, can be removed from the bottom if desired.

Use ACTION Card, opposite page 64. Encircle No. 75

**You're not gambling
IF you have an ACE in the hole!**

ACE DRILL BUSHINGS are always a sure bet!

- Quality • Accuracy
- Largest Deliverable Stocks Anywhere!

Over 22,000 sizes, types and specifications in A.S.A. and ACE standards, micro and super sizes plus bushings for embedment in plastic or castable material.

ACE DRILL BUSHING CO., INC.
5407 Fountain Ave., Los Angeles 29, Calif.

Write For Catalog D



insist on famous
"Jorgensen"
THE CLAMP OFF
"C" CLAMPS

Also bar clamps, hinged clamps, spring clamps, etc.
 Send For Free 32-Page Catalog
ADJUSTABLE CLAMP CO.
 "The Clamp Folks"
 403 N. Ashland, Chicago 22, Ill.
ASK YOUR SUPPLIER

RUGGED!

Encircle No. 415 on Card, Opposite Page 65

**READING BENCH
 KEYSEATER**

Portable — move directly to job; a time saver for both small and large shops.

3 1/4" stroke; adaptable for other work.

Low first cost—prompt delivery. Good dealers wanted.

Reading Machine Co.
 Cincinnati 37, Ohio



Encircle No. 416 on Card, Opposite Page 65

JIG BORING

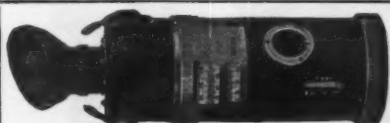
and

**Large Precision Machining
 Done to your specifications**

WE HAVE 13 JIG BORERS

KIDDE PRECISION TOOL CORP.
 25 LOCUST AVE. ROSELAND, N.J.

Encircle No. 417 on Card, Opposite Page 65



The simplified PYRO Optical is the Ideal instrument for direct temperature readings of ANY heated object in your plant. Completely SELF-CONTAINED, PORTABLE, RUGGED, LIGHT WEIGHT (3 1/2 lbs.) and FOOLPROOF. No correction charts, no accessories and no maintenance expenses. Unique design permits temperature determination even on MINUTE SPOTS, Fast MOVING OBJECTS and of the SMALLEST STREAMS.

Write for Catalog No. 80

THE PYROMETER INSTRUMENT CO.
 New Plant and Laboratory, Bergenfield 3, N. J.

Encircle No. 418 on Card, Opposite Page 65

264

CAM MILLING

Fully equipped modern machine shop with extensive Jig Boring, Surface Grinding, Horizontal Boring and Thread Grinding facilities as well as modern Cam Milling and Cam Grinding equipment.

Your Inquiries Answered Promptly

HIMOFF MACHINE CO., INC.
 23-21 44th Road Long Island City 1, N. Y.

Encircle No. 419 on Card, Opposite Page 65



NEW NESTING TYPE

TOTE PANS

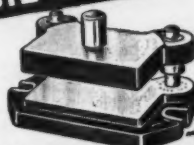
Sturdy 16 ga. metal.
 20" long x 12" wide
 x 6 1/4" deep. Drag
 holes and handles at
 both ends.

J. L. LUCAS & SON, INC.
 Bridgeport 5, Conn.

Encircle No. 420 on Card, Opposite Page 65

DANNEMAN
Precision
DIE-SETS

Precision-Bored
 on Master Plates



DANNEMAN DIE-SET DIVISION
ACME-DANNEMAN COMPANY, Inc.
 201 Lafayette St. New York 12, N. Y.

CATALOG
 ON REQUEST

Encircle No. 421 on Card, Opposite Page 65

ZAJON
SEGMENTAL
CAM
BLANKS

"SAVE DOLLARS by the hundredths"
 (Trade Mark)

00 - 0 - 2 - 4 - 6

Alloy Cast Iron

Roy ZaJon Machine Parts

7801 S. Claremont Ave. Chicago 20, Ill.

Encircle No. 422 on Card, Opposite Page 65
 MACHINE and TOOL BLUE BOOK

Press line features 11 sizes

The H-P-M line of oil hydraulic C-frame presses, ranging in size up to 200 tons, has been announced by the Hydraulic Press Mfg. Co., Dept. BB, Mount Gilead, Ohio.

Presses are designed for low tonnage jobs, and include 11 sizes: 2, 5, 10, 15, 25, 35, 50, 75, 100, 150, and 200-ton models. Operating controls available include single or dual safety operating levers, electric pushbutton, foot switch, foot pedal and other standard types.

A high speed differential circuit and inching control allows the press operator to literally inch the ram downward or upward while setting dies.

Open C-gap frame eliminates encumbrances within the tooling area and provides room for tooling.

Use ACTION Card, opposite page 64. Encircle No. 76

Universal bench brake for short run production

The Model U322 universal bench brake is claimed to be particularly fitted to accurate short run production and experimental work as well as plain or box and pan jobs that would tie up larger more expensive equipment. The machine is also portable for on the job setup.

Rated capacity of the Model U322 is a 3/4 flange on 22 gauge mild steel, full 3 ft. length. Fingers of case hardened steel in widths of 2, 3, and 4 inches allow box depths to 3 inches. Design features include replaceable bronze bushings, easy adjustments and simple operation. W. Whitney Stueck, Inc., 1 Connecticut Ave., Dept. B, Old Saybrook, Conn.

Use ACTION Card, opposite page 64. Encircle No. 77

Universal vertical head converts horizontal machines

A universal vertical head that is said to convert horizontal machines to all-angle vertical mills has been announced by the Rotex Punch Co., Dept. B, 2350 Alvarado St., San Leandro, Calif.

It is a self-contained, independent, five



Cincinnati
Centerless
Tool

*when only
a diamond tool
will do the job...
ASCO has
the answer!*

The right diamond for the right tool. Manufacturers: diamond tools, wheels, compound. Importers & dealers: carbons, borts, ballas. WRITE TODAY FOR FREE CATALOGS & LITERATURE.



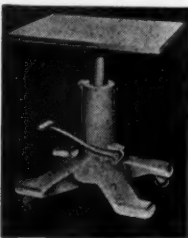
ANTON Smit & CO. INC.

Specialists in diamonds and diamond tools since 1908.

333 W. 52nd, New York 19, N.Y.

Representatives: Territories Open; Inquiries Invited
Encircle No. 423 on Card, Opposite Page 65

PORTABLE ELEVATING TABLE



**Saves
TIME
and
LABOR**

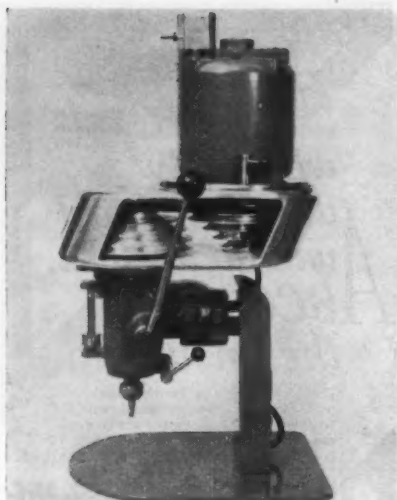
Eliminate heavy lifting and cut handling costs. Slight foot pressure varies height from 31" to 46 1/2", leaving operator's hands free. Table swivels and locks in any position.

Our major services — Designing and Building — Dies, jigs, fixtures and special machinery.

SEND TODAY FOR ILLUSTRATED CATALOG No. 2

**THE MIDWEST TOOL & ENG. CO.
112 WEBSTER ST., DAYTON, OHIO**

Encircle No. 424 on Card, Opposite Page 65



speed, motor driven unit that can be positioned angularly with the spindle

lever-locked in any position. A micro-meter adjustment on the quill front gives the operator cutting measurements up to .001 over a two-inch travel.

Five spindle speeds—390, 710, 1200, 2500, or 5200 rpm—are provided by a one-third hp, 110 volt, single-phase reversible motor located above the belt housing. Standard Y type collets are available from 3/16" to 1/2".

Use ACTION Card, opposite page 64. Encircle No. 78

Ultra-speed hobber with universal gear production

The Model 1445 Ultra-Speed hobber has been released by Michigan Tool Company, Dept. BB, 7171 E. McNichols Rd., Detroit, Mich.

A single-spindle hobber, the 1445 will machine both spur and helical gears at selective variable speeds ranging to 570 rpm. It will handle up to 8 pitch gears having diameters as large as 5" and face widths to 4". Either climb or



do you have a
TOOL PROBLEM

Columbus Die-Tool has been solving tooling problems for over 45 years. Expert designers and builders of all types of tools and special machinery. Write us today!

COLUMBUS DIE-TOOL
and Machine Co.
P. O. BOX 750 • COLUMBUS, OHIO

Encircle No. 425 on Card, Opposite Page 65

266

WHOOOEE!

YOU DON'T HAVE TO LOOK FAR TO DISCOVER

W. H. O. *

IS TOPS IN THE PRECISION SCREW MACHINE PRODUCTS FIELD.



**CAP SCREWS
COUPLING BOLTS
SET SCREWS
MILLED STUDS**

... our specialty.

** Wm. H. Ottumiller Co* YORK, PA.
Encircle No. 426 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

Sid Tool Company

WHY WAIT FOR SPECIAL DRILLS?

... Has them IN STOCK for IMMEDIATE DELIVERY!

Extra Long Length High Speed Drills—Straight Shank

TAPER LENGTH WIRE GAUGE SIZES

Wire Gauge Nos.	Price Each	Length Overall Inches	Approx. Length of Twist Inches	Wire Gauge Nos.	Price Each	Length Overall Inches	Approx. Length of Twist Inches
1	\$1.00	6 1/8	3 3/4	31	.70	5 1/8	3
2	1.00	6 1/8	3 3/4	32	.70	5 1/8	3
3	1.00	6	3 3/8	33	.70	5 1/8	3
4	1.00	6	3 3/8	34	.70	5 1/8	3
5	1.00	6	3 3/8	35	.70	5 1/8	3
6	1.00	6	3 3/8	36	.70	4 3/4	2 1/2
7	1.00	6	3 3/8	37	.70	4 3/4	2 1/2
8	1.00	6	3 3/8	38	.70	4 3/4	2 1/2
9	1.00	6	3 3/8	39	.70	4 3/4	2 1/2
10	1.00	6	3 3/8	40	.70	4 3/4	2 1/2
11	.90	6	3 3/8	41	.60	4 3/4	2 1/2
12	.90	6	3 3/8	42	.60	4 1/4	2 1/4
13	.90	5 1/4	3 1/2	43	.60	4 1/4	2 1/4
14	.90	5 1/4	3 1/2	44	.60	4 1/4	2 1/4
15	.90	5 1/4	3 1/2	45	.60	4 1/4	2 1/4
16	.90	5 1/4	3 1/2	46	.60	4 1/4	2 1/4
17	.90	5 1/4	3 1/2	47	.60	4 1/4	2 1/4
18	.90	5 1/4	3 1/2	48	.60	3 3/4	2
19	.90	5 1/4	3 1/2	49	.60	3 3/4	2
20	.90	5 1/4	3 1/2	50	.60	3 3/4	2
21	.80	5 1/4	3 1/2	51	.50	3 3/4	2
22	.80	5 1/4	3 1/2	52	.50	3 3/4	2
23	.80	5 1/4	3 1/4	53	.50	3	1 3/4
24	.80	5 1/4	3 1/4	54	.50	3	1 3/4
25	.80	5 1/4	3 1/4	55	.50	3	1 3/4
26	.80	5 1/4	3 1/4	56	.50	2 1/4	1 1/8
27	.80	5 1/4	3 1/4	57	.50	2 1/4	1 1/8
28	.80	5 1/4	3 1/4	58	.50	2 1/4	1 1/8
29	.80	5 1/4	3 1/4	59	.50	2 1/4	1 1/8
30	.80	5 1/4	3 1/4	60	.50	2 1/4	1 1/8

S Set \$1—1 ea. \$1-60 Long Drills. Consists of 60 Drills\$40.00
 E Set \$2—1 ea. Letter A-Z Long Drills. Consists of 26 Drills40.00
 T Set \$4—1 ea. 1/8 to 1/2 Extra Long Drills. 12" Overall, 9" Flute. Consists of 25 Drills x 64ths 55.00

STRAIGHT SHANK 12" LONG 9" FLUTE

Size Inches	Price Each Net	Size Inches	Price Each Net
1/8	\$1.65	5/16	2.25
9/64	1.65	21/64	2.50
5/32	1.65	11/32	2.50
11/64	1.65	23/64	2.75
3/16	1.65	3/8	2.75
13/64	1.80	25/64	3.05
7/32	1.80	13/32	3.05
15/64	1.95	27/64	3.30
1/4	1.95	7/16	3.30
17/64	2.05	29/64	3.60
9/32	2.05	15/32	3.60
19/64	2.25	31/64	3.60
		1/2	3.60

15" LONG 12" FLUTE

Size	Price Each	Size	Price Each
17/32	\$7.00	21/32	9.00
9/16	7.70	11/16	9.10
19/32	8.25	23/32	9.35
5/8	8.80	3/4	9.50

Taper Length Letter Sizes STRAIGHT SHANK

Size	Price Each	Length Overall Inches	Approx. Length of Twist Inches
A-E	\$1.64	6 1/8	4
F-K	1.71	6 1/4	4
L-N	1.78	6 3/8	4 1/8
O-R	1.86	6 1/2	4 1/8
S-U	2.00	6 3/4	4 1/8
V-Y	2.14	7	4 3/8
Z	2.29	7 1/4	4 5/8

TAPER SHANK

Size	Price Each	Length Inches	Twist Inches	Shank Size	Size	Price Each	Length Inches	Twist Inches	Shank Size
33/64	\$7.15	17	13	No. 2 M.T.	47/64	\$ 9.50	17	13	No. 2 M.T.
17/32	7.15	17	13	No. 2 M.T.	3/4	9.50	17	13	No. 2 M.T.
35/64	7.70	17	13	No. 2 M.T.	25/32	10.20	17	13	No. 2 M.T.
9/16	7.70	17	13	No. 2 M.T.	13/16	12.00	18	13 3/8	No. 3 M.T.
37/64	8.25	17	13	No. 2 M.T.	27/32	12.50	18	13 3/8	No. 3 M.T.
19/32	8.25	17	13	No. 2 M.T.	7/8	13.20	18	13 3/8	No. 3 M.T.
39/64	8.80	17	13	No. 2 M.T.	29/32	13.75	18	13 3/8	No. 3 M.T.
5/8	8.80	17	13	No. 2 M.T.	15/16	14.30	18	13 3/8	No. 3 M.T.
41/64	9.00	17	13	No. 2 M.T.	31/32	15.40	18	13 3/8	No. 3 M.T.
21/32	9.00	17	13	No. 2 M.T.	1	17.60	20 1/2	15 3/8	No. 3 M.T.
43/64	9.10	17	13	No. 2 M.T.	1-1/16	18.70	20 1/2	15 3/8	No. 3 M.T.
11/16	9.10	17	13	No. 2 M.T.	1-1/8	19.80	21 1/2	15 3/8	No. 4 M.T.
45/64	9.35	17	13	No. 2 M.T.	1-3/16	22.00	21 1/2	15 3/8	No. 4 M.T.
23/32	9.35	17	13	No. 2 M.T.	1-1/4	24.00	21 1/2	15 3/8	No. 4 M.T.

DEALER INQUIRIES INVITED

Sid Tool Co., Inc.

126 LAFAYETTE STREET
NEW YORK 13

BOSTON UNIVERSAL ANGLE PLATE

A Precision Tool
that Holds Work
at Any Desired
Angle.



Horizontal motion is 360 degrees; vertical motion, 120 degrees. Fitted with vernier scale reading to 5 minutes.

Puts Speed and Profit into Angular
Drilling, Milling, Planing, Shaping, Grinding

With a Boston Universal Angle Plate on the job, work is quickly set up on the table and but a few seconds are required to locate it at the desired angle. Indispensable in tool rooms and extremely useful in production runs, the Boston Universal pays for itself many times over by eliminating the necessity of expensive jigs and fixtures.

Made in several stock sizes. Write today for full information.

US AUTOMATIC BOX MACHINERY CO., Inc.

11 ARBORETUM RD.
BOSTON 31, MASS.

Encircle No. 428 on Card, Opposite Page 65

MAKE HARDNESS TESTS With The KING PORTABLE BRINELL

Puts a load of 3000 kg. on a 10 mm ball. Can be used in any position — even upside down. Removable test head for testing very large parts. Guaranteed to make accurate Brinell tests. Throat: 4", gap 10", wt. 26 lb.



ANDREW KING
Box 606-H Ardmore, Pa.



Encircle No. 429 on Card, Opposite Page 65



SELLEN (adjustable)
stock drillheads will
greatly increase your
drilling output

STOCK SIZES AS SHOWN

No. 0-S (2 spin.)—drill cap. $\frac{1}{4}$ "
No. 0-AD (3 spin.)—drill cap. $\frac{1}{8}$ "
No. 0-D (3 spin.)—drill cap. $\frac{1}{4}$ "
No. 1-D (3 spin.)—No. 1 M. tap.
No. 2-D (3 spin.)—No. 2 M. tap.
No. 3-D (3 spin.)—No. 3 M. tap.

Send us your drilling
requirements.

Sellen Machine Tool Co.
PAWTUCKET, R. I.
Inc. 1910

Encircle No. 430 on Card, Opposite Page 65



DRILL THESE HOLES

BY A QUICK, EASY, INEXPENSIVE METHOD

Your business letterhead will bring literature

WATTS BROS. TOOL WORKS
Wilmerding, Pa.

Encircle No. 431 on Card, Opposite Page 65

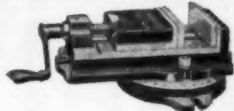
LW SWIVEL BASE MILLING MACHINE VISES

AS LOW AS
\$46.75

Send for free
catalog on
vises, power
hack saws, magnetic chucks, dividing heads.

L-W CHUCK COMPANY

23 So. St. Clair St. Toledo 4, Ohio



Encircle No. 432 on Card, Opposite Page 65

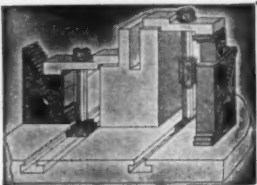
CAMS

To Your Specifications
except Screw Machine Cams

Design Assistance Offered

KIDDE PRECISION TOOL CORP.
25 LOCUST AVE. ROSELAND, N.J.

Encircle No. 433 on Card, Opposite Page 65



— T T C O —

Sure Grip Step Blocks and Stud Sets Clamp
Assemblies at low prices.

TIETZMANN TOOL CORPORATION
DEPT. C. T. ENGLEWOOD, OHIO

Encircle No. 434 on Card, Opposite Page 65

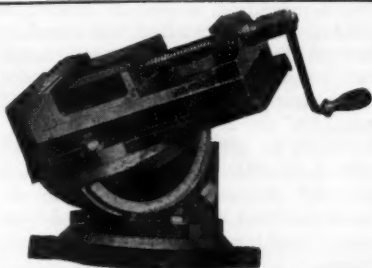
SET UP COMPOUND ANGLES INSTANTLY!

Now save valuable time on intricate, angular set-ups with the fully universal MASTER MULTI-SWIVEL VISE. Three swivels instantly set any compound angle. Used worldwide. Interchangeable platens optional.

Write for circular.

DONOVAN MFG. CO.

80 Batterymarch St. Boston 10, Mass.



Encircle No. 435 on Card, Opposite Page 65

conventional hobbing can be utilized.

Highlighting the universality of the 1445 hobber is the hobbing spindle head. Three separate adjustments have been incorporated into the head: hob thread angle, gear helix angle, and hob position shift. Hob angles of plus or minus 15°, and left or right helix angles up to 45° can be setup within a matter of seconds, it is claimed. Hob position is shifted hydraulically over a total movement of 3 inches.

Use ACTION Card, opposite page 64. Encircle No. 79

Clamp-type air cylinder has universal mounting

The 900 Series clamp-type air cylinder with universal mounting is now available in 2" bore size, 1" and 2" stroke lengths, from Modernair Corp., Dept. BB, San Leandro, Calif.

The one-piece aluminum casting has a flat base for either horizontal or



With DYKEM Steel Blue **Without DYKEM Steel Blue**

DYKEM STEEL BLUE

Stops Losses

making Dies and Templates

Popular package 8-oz. can fitted with Bakelite cap holding soft-hair brush for applying right at bench; metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, prevents metal glare. Increases efficiency and accuracy.

Write for sample on company letterhead
THE DYKEM COMPANY
 2301G North 11th St. • St. Louis 6, Mo.

Encircle No. 436 on Card, Opposite Page 65

vertical mounting. Holes are slotted so cylinder can be installed, relocated or removed by merely loosening hold-down bolts. Over-all length of cylinder (piston retracted) is only $4\frac{3}{4}$ " for 1" stroke, $5\frac{3}{4}$ " for 2".

Cylinder is spring-return type, normally retracted. Stainless steel piston rod is $\frac{1}{2}$ " diameter, extends $\frac{7}{8}$ " in retracted position, operated in oilite-type bronze bushing locked to prevent drifting.

Use ACTION Card, opposite page 64. Encircle No. 80

High feed rate roughing cutter

An extra-close-bladed, high feed rate Shear Clear face mill is providing increases of from 75% to 100% in tool life while in use on production jobs, according to the manufacturer, the Ingersoll Milling Machine Co., Dept. BB, Rockford, Ill.

There are five carbide-tipped blades for every inch of diameter; manufactured in diameters from 4" up. High



feed rates and long tool life are achieved by a new principle of placing blades close together, plus the use of the free cutting, shearing action.

Use ACTION Card, opposite page 64. Encircle No. 81

Converts drills to hi-speed

A converter which fits into chuck of any standard bench drill press has been announced by the Dirzius Machine

BOYAR-SCHULTZ
Precision-made
ALLOY STEEL

T-SLOT BOLTS

For MAXIMUM EFFICIENCY and PROLONGED MACHINE LIFE

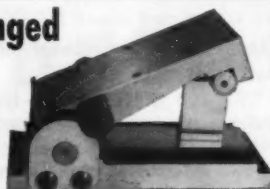
ACCURACY of costly machine tools may be ruined using ordinary bolts of soft steel. It is low cost insurance to use Boyar-Schultz precision made T-Slot bolts. Made from heat treated, Alloy steel, heads machined at right angle to shank, to present a broad, flat surface to upper surface of T-slots. Class 3 threads do not strip or distort. For best results use Special Nuts and Washers.

BOYAR-SCHULTZ CORPORATION
2008 S. 25th Ave., Dept. F-B, Broadview, Ill.

Encircle No. 438 on Card, Opposite Page 65
270

5" Hinged Sine Plate

ONLY \$109.50



Precision • Convenience • Economy

Exclusive locking device provides a rigid unit for operations such as grinding. May be used with a permanent magnetic chuck. Accurate to .0002" in center distance and parallelism for length of tool.

- Precision ground • Hardened rolls • Tapped holes • End plates • Immediate shipment

BALD EAGLE SINE TOOLS

No.	Center Dist.	Width Top	Length	Price with Oak Case
1605	5" +/- .0002"	3"	6 $\frac{3}{4}$ "	\$43.00
1610	10" +/- .0002"	3"	11 $\frac{7}{8}$ "	\$95.00
1705	5" +/- .0002"	1"	6 $\frac{3}{4}$ "	\$25.25
1805	5" +/- .0002"	3"	8 $\frac{1}{4}$ "	\$109.50

F.O.B. St. Paul.

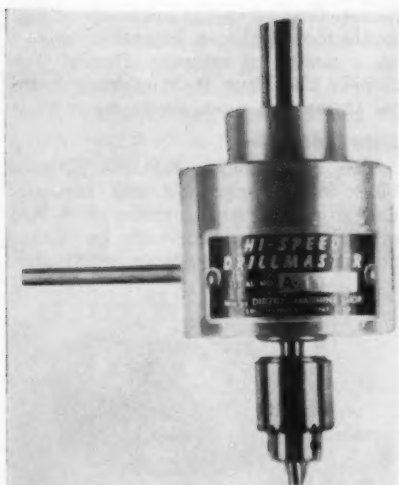
Order from Your Dealer or Direct



Bald Eagle Tool Co.

357 Minnesota St., St. Paul 1, Minn.

Encircle No. 437 on Card, Opposite Page 65
MACHINE and TOOL BLUE BOOK



Shop, Dept. MTB, 1423-25 S. 52nd. Ave., Cicero 50, Ill.

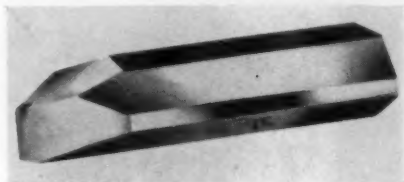
It houses a precision built gear train which has a speed ratio of four to one,

and when applied to any drill press reportedly multiplies its speed four times. Spindle shank fits any $\frac{1}{2}$ " chuck, holding drills from 5/32 to No. 80.

Use ACTION Card, opposite page 64. Encircle No. 82

Diamond holding alloy

A new diamond holding formula, M-28, has been developed. The alloy guards against diamond loss even un-



der difficult operating conditions. Free replacement of any new shape tool should failure of setting occur. American Coldset Corp., Dept. B, 87 Court St., Paterson, N.J.

Use ACTION Card, opposite page 64. Encircle No. 84



LASSY TAPPERS

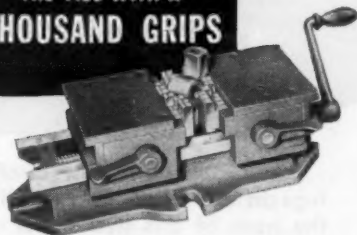
New! Exclusive Features

Set new standards for cut thread accuracy. Are universally used in the Tool Room and for small lot production. No set up. Always ready for instant use.

LASSY TOOL CO.

Plainville, Conn.

THE VISE WITH A THOUSAND GRIPS



'FLEXIBLE JAWS' grip all shapes. Grips secure and positive for precise milling, drilling and cutting operations. Eliminate the time and expense of blocking and shimming irregular pieces for toolroom machining. Applicable on any machine tool. Try it in your shop. Save time and dollars on small production runs.

at the Chicago (Booth 912) and Philadelphia Shows (Booth 2047)

WRITE FOR INFORMATION TODAY!



AMPOGRIP
CONTOUR GRIPPING
UNIVERSAL FIXTURES

AMERICAN POSITIVE GRIP VISE CORP.

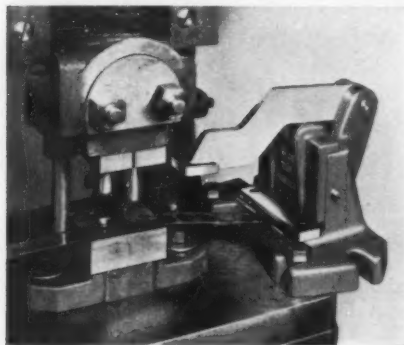
2-D Olivine Street
Williamansett, Mass.

Encircle No. 440 on Card, Opposite Page 65
July, 1955

Encircle No. 439 on Card, Opposite Page 65
271

Scrap chopper powered by press ram

A compact scrap chopper which can be easily installed close to the die by means of two bolts is powered by the press ram completely independent of the die or tool and operates with each stroke of the press. Unit can operate in and from any position on the press bed, with the scrap cuttings falling into a con-



tainer. Cutting blades are made of high grade tool steel, can be easily replaced in a matter of minutes. Durant Tool Supply Co., Dept. B, Providence 3, R.I. Use ACTION Card, opposite page 64. Encircle No. 107

Roto indexer

This roto indexer features patented block-out arrangement and hardened and ground 20 station index plate. Any or all stations can reportedly be blocked out with a screw driver. With rigid

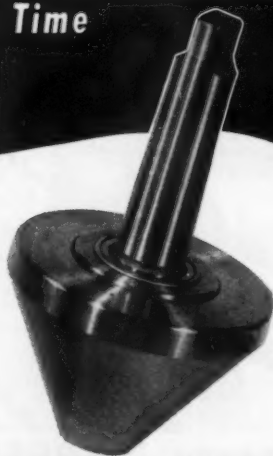


PERFECT ALIGNMENT Every Time with ROOFE Heavy-Duty BULL NOSE CENTERS

Two double rows of quality bearings in the large and small ends of the nose of this live center are your assurance of perfect alignment on any type of work.

Two shank sizes provide diameters from $\frac{1}{2}$ " to $7\frac{1}{2}$ " for a wide range of work with a single center.

Write now for complete catalog of all types of ROOFE Live Centers.



HOUSTON GRINDING & MFG., CO., Inc.

2110 QUITMAN STREET • HOUSTON 10, TEXAS

Reliable Distributors Wanted

locking center bearing, oil grooved bearing surfaces and graduation in degrees, it can reportedly be used in vertical or horizontal position.

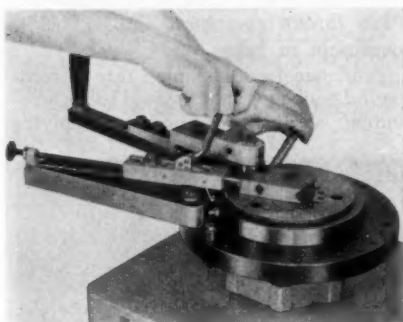
It is made in two sizes, 12 and 15 inches. Four models, AC-12 has special 12" diameter steel body chuck. AX-2 has 12" platen with a 4½" diameter pilot. AH-12 has 12" T-slotted turntable and AL-15 has 15" T-slotted turntable. Troyke Mfg. Co., Dept. B, 4422 Appleton St., Cincinnati 9, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 108

Quik-Lok clamp for benders

A material clamping device designed for both Di-Acro benders No. 1 and 1A has been announced by O'Neil-Irwin Mfg. Co., Dept. B, 562 Eighth Ave., Lake City, Minn.

Designated Di-Acro Quik-Lok clamp, this accessory is said to be especially valuable when forming tubing, angle, channel and extrusions because it locks

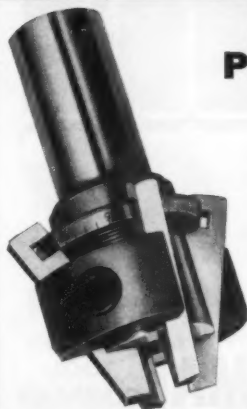


the material securely in position and can be instantly released to remove the formed part.

Adjustable for any radius to 2 inches on the No. 1 model and 6 inches on the No. 1A model, it will handle stainless steel tubing up to ½" dia., round steel bar up to ⅝", as well as many other types of material within the capacity of the benders.

Use ACTION Card, opposite page 64. Encircle No. 109

KUTMORE ADJUSTABLE HOLLOW MILLS



ENGINEERED FOR . . . PRECISION PRODUCTION

- Any COMBINATION of . . . Turning . . . Tapering . . . Facing . . . Chamfering . . . Trepanning in ONE PASS.
- Exclusive MICROMETER Adjustment Feature For Rapid Set-Up.
- Area Sales engineers for your immediate Problems.

Write for Catalogue No. 20 MP

EXCLUSIVE CANADIAN REPRESENTATIVE

RUDEL MACHINERY COMPANY LIMITED

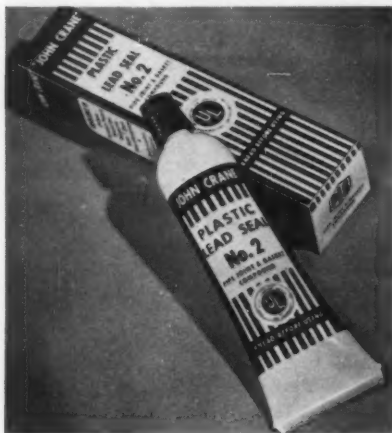
MONTREAL — TORONTO — WINDSOR — VANCOUVER

CARL WIRTH & SON, INC. 1625 CLINTON AVE. NO. ROCHESTER 5, N. Y.

Encircle No. 442 on Card, Opposite Page 65

Pipe thread compound available in tubes

A plastic lead seal pipe thread compound packaged in polyvinyl tubes, providing an easy method of applying



without waste or mess, gives a permanent, leakproof seal, yet is non-hardening, thus permitting easy disassembly of connections, even after years of service. It is claimed to withstand pressures up to 6000 psi., temperatures to 600° F. and is insoluble in water, steam, gas, refrigerants and petroleum products. Crane Packing Co., Dept. MBW, 1800 Cuyler Ave., Chicago 13, Ill.

Use ACTION Card, opposite page 64. Encircle No. 110

Lightweight coping wheel

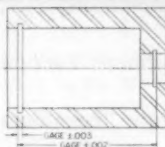
The George H. Bullard Co., Inc., Dept. B, Westboro, Mass., has announced a new coping wheel, the Safe-Center, which reportedly retains all the strength of the heavy steel center type, yet by elimination of the steel plate, the weight is lessened by approximately 50%.

Because of the special wheel construction as a single unit, the cutting rim becomes an integral part of the wheel, which increases the safety factor. This permits two full inches of

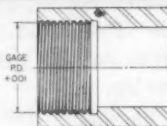
Special GAGING PROBLEM?

We Can Solve It!

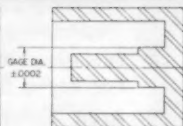
K. M. Joehneck (left)
H. M. Zimmerman (right)



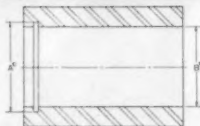
**PROBLEM 1
SOLVED**



**PROBLEM 2
SOLVED**



**PROBLEM 3
SOLVED**



**PROBLEM 4
SOLVED**

If You Can Machine It INSIDE . . . We Produce The Gage To MEASURE It! We haven't been licked on an internal measurement problem yet! Tell us your gaging needs — send along a sketch of the part to be measured and we'll show you how a RIMAT Gage can measure it. Write TODAY . . . don't forget the sketch!

RIMAT TOOL COMPANY
21 W. Dayton St.
Pasadena, Calif., Dept MT-7

RY-3



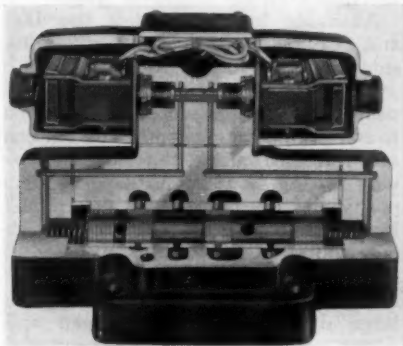
usable cutting material. This coping wheel does away with wheel returns. It is simply discarded when completely worn out.

Use ACTION Card, opposite page 64. Encircle No. 111

Four-way valve is solenoid-controlled

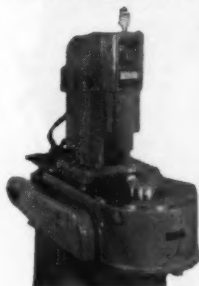
A $\frac{3}{4}$ " balanced piston, sleeve-type, 2000 psi. valve has been announced by Racine Hydraulics & Machinery, Inc., Dept. B, Racine, Wis. This four-way valve, 59-S, is solenoid-controlled, pilot-operated, and subplate-mounted.

Spring-centered, spring-offset or no-spring models can be readily converted



PDC

AUTOMATIC INDEXING ASSEMBLY PRESS



CAPACITIES
TO 6 TONS

14 $\frac{3}{4}$ " DIAMETER
DIAL PLATE

ELECTRIC
MOTOR DRIVE

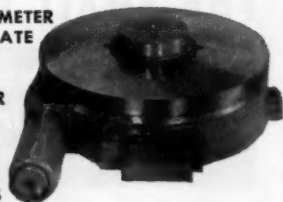
PDC

AUTOMATIC GENEVA MOTION INDEX TABLES

14 $\frac{3}{4}$ " DIAMETER
DIAL PLATE

ROTARY
AIR MOTOR
DRIVE

COMPLETE
WITH ALL
CONTROLS



PRECISION DETROIT CO. 20103 SHERWOOD DETROIT 34, MICH.

CALL YOUR AREA REPRESENTATIVE:

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LOS ANGELES.....	VIctoria 9-1803

DETROIT (Home Office & Plant,) TWInbrook 2-5331

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NEW YORK CITY.....	Murray Hill 3-6135
PHILADELPHIA.....	Michigan 4-0807
SAN FRANCISCO.....	OLympic 3-3161
ST. LOUIS.....	JEfferson 5-1223

from one type to another. Its recommended capacity is 1¼ gpm. One of the new features is the compact, concealed dust-proof housing of the twin solenoids. Solenoids are fastened to the valve by the cover only. When covers are removed, electrical operation cannot be made.

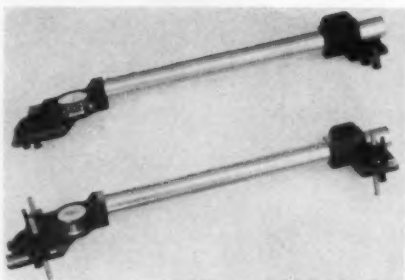
Use ACTION Card, opposite page 64. Encircle No. 112

Internal-external diameter gages

Available in two models the IEG and IET gages are used for either inside or outside diameters.

The IEG is a single depth design using movable, one depth rest buttons to control the gaging depth. The buttons are relocated along the slot to provide resting surface for the gage. The position of the buttons are determined by the workpiece and whether the gage is set up for ID or OD measurement.

Model IET is a multi-depth checking design, particularly useful for checking large diameter work for tapen and minor steps. The rest pins are grooved



and snapped to the desired depth by releasing a trigger lock and merely moving the pins for the different depth setting requirements. The jaws carrying the pins are movable to set up the gage to suit the workpiece and to change from id to od measurement.

Standard ranges of these IE style gages are from 8" to 44" gaging length (six sizes) and up to 3½" gaging depth. Acra-ment Gage Div., Myer Corp., Dept. MTB, Park Ave., Cranston, R.I.

Use ACTION Card, opposite page 64. Encircle No. 113

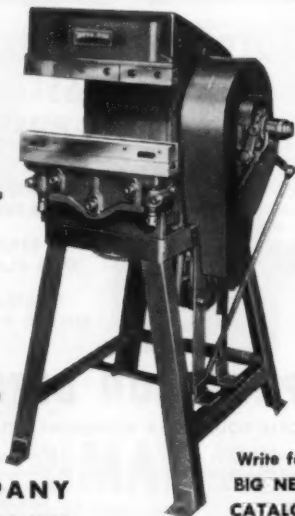
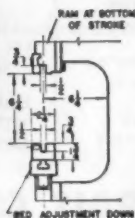
A NEAT LITTLE PRESS BRAKE FOR SMALL FORMINGS

WHITNEY-JENSEN
No. 247 18-inch
PRESS BRAKE

47 Strokes/min.

CAPACITY

14-Ga. Mild Steel or 4½ Tons



Write for
BIG NEW
CATALOG

WHITNEY METAL TOOL COMPANY

718 FORBES ST., ROCKFORD, ILL. Since 1910

Encircle No. 445 on Card, Opposite Page 65

COOPER WEYMOUTH VARIABLE SPEED STOCK STRAIGHTENERS

Portable cabinet units in sizes 6" up to 24". Constant or variable speed drives with forward, reverse and cut-out switch. Five, seven or nine straightening rolls. Pinch rolls and all bottom straightening rolls power driven.

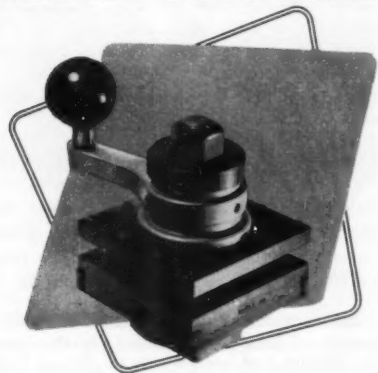


**WRITE FOR
DETAILS**

**COOPER
WEYMOUTH
INC.**

277 NOBLE AVE., BRIDGEPORT 8, CONN.

Encircle No. 446 on Card, Opposite Page 65



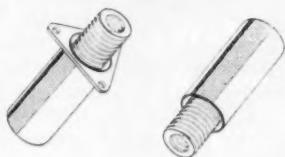
A 4 position automatic indexing tool—RIGID-ACCURATE-COMPACT. Built to most exacting requirements. Parts are of alloy or tool steel, heat treated and ground to closest working tolerances. Available for 12", 14" and 16" machines. Write for complete details and illustrated folders.

Westwood Engineering
2234 Purdue Ave. West Los Angeles

Encircle No. 447 on Card, Opposite Page 65
July, 1955

SPRING CAGES

for
**PROTECTION FROM
SPRING FAILURE
IN HIGH PRODUCTION
DIES.**



Catalog Upon Request

MOTOROL ENGINEERING CO.

5414 W. McNichols Rd.
Detroit 21, Mich.

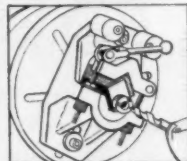
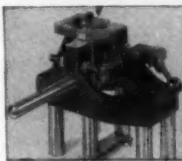
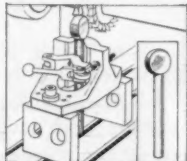
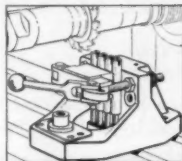
DISTRIBUTOR INQUIRY INVITED.

Encircle No. 448 on Card, Opposite Page 65

LASSY

WORK HOLDERS

Convert Tooling Time to Production Time



Save Hundreds of Tooling \$ \$ \$ \$ \$ \$

Order direct or write for name of Stocking Dealer. Illustrated circular FREE.

One Tool for Many Uses

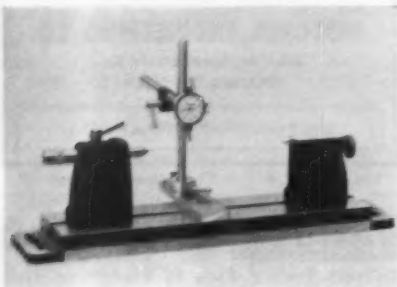
LASSY TOOL CO. Plainville, Conn.

Encircle No. 449 on Card, Opposite Page 65
277

Bench center checking set

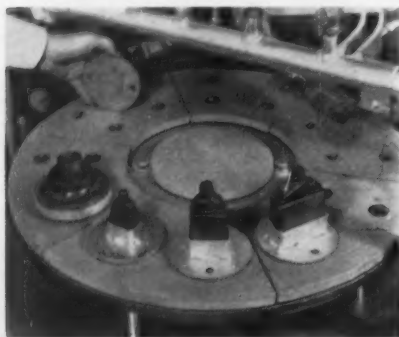
A complete Geneva bench center checking set featuring a slide with a versatile tip-over upright has been announced by Chicago Dial Indicator Co., Dept. C, 180 N. Wacker Dr., Chicago, Ill. Mounted on a Hardinge bench center unit, the large diameter upright and indicator holding rod provides a sturdy support for the indicator and tilts backward, forward, and sidewise to accommodate every type of material and facilitate loading, straightening, and adjusting of work. The upright maintains original zero setting when returned and locked in place.

The unit is compact, portable, and



Self-contained, gas fired packaged unit for brazing

A self-contained, gas fired packaged unit has been developed by Selas Corp.



requires little bench space. Both tailstocks can be locked in any position along the base and have a maximum capacity between centers of 11 9/16". Both the lever operated, spring actuated tailstock spindle and the screw tailstock spindle have a 3/4" travel.

Included as standard equipment is the Geneva Indicator 135F with balanced dial and graduations to .0005". Other Geneva dials may be substituted for special checking purposes.

Use ACTION Card, opposite page 64. Encircle No. 51

Carbide step cutters

Carbide tipped step cutters, recommended for the machining of any type wood, plastics and non-ferrous metals have been announced by the Onsrud Cutter Mfg. Co., Dept. B, 820 E. Broadway, Libertyville, Ill.

Carbon steel is used for the cutter body. The cutters are staggered on the spindle forming steps, which give intermittent cuts. If desired, they could be ground with side clearance so that they may be used for slotting, grooving or other operations.

Use ACTION Card, opposite page 64. Encircle No. 52

of America, Dept. B, Philadelphia 34, Pa. It is claimed to give fast automatic brazing for many types of small and medium size assemblies. Simple joints in small parts may be brazed at rates as high as 500 assemblies per hour.

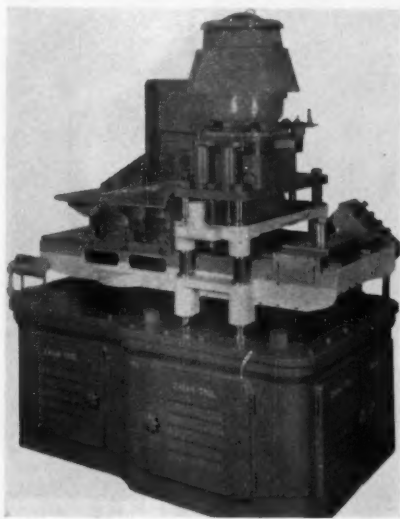
Each machine is engineered to meet a range of jobs as specified by the user. Use ACTION Card, opposite page 64. Encircle No. 53

Simple fixtures hold parts to be brazed on the turntable of the Selas packaged automatic brazing machine. Shown are the different fixtures needed for brazing assemblies of four different sizes and shapes. Pin-and-hole mounting provides accurate positioning and quick changeover.

Mechanical drilling machine has 529-spindle drill head

Zagar Tool, Inc., announces a new high speed drilling machine with all machine movements being mechanical.

The diameter of the holes drilled by this machine is $3/16"$. The drill head is of the gearless design, permitting centers as close as $1/4"$. Material to be drilled is loaded manually into a hopper. It is mechanically positioned under the drill head for the drilling cycle. Removal of the drilled part can be done



by the next piece as it is fed mechanically to drilling position.

The 529-spindle drill head is directly driven with a 30 horsepower motor. The ram is actuated by a mechanical motion similar to that of a shaper and is located in the base of the machine. The length of stroke, depth of drill and rate of speed can be adjusted to hole-finish requirements.

The machine was designed and built by Zagar Tool, Inc., 24000 Lakeland Blvd., Dept. BB, Cleveland 23, O.

Use ACTION Card, opposite page 64. Encircle No. 114

July, 1955

**SIMPLIFIED
DESIGN OF
UNIVERSAL
COLLET
CHUCKS
PROVIDE
A SURER
GRIP
FOR
LONGER
TOOL
LIFE**

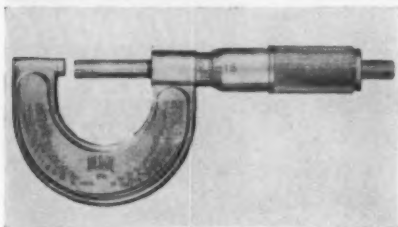
182-B

**UNIVERSAL
ENGINEERING COMPANY**
FRANKENMUTH 10, MICHIGAN

Encircle No. 450 on Card, Opposite Page 65
279

One inch micrometer for general use

A low cost precision 1" micrometer with an accuracy of .001" has been designed for use where the higher precision of more expensive micrometers is not necessary.



It is finished in a dull chrome-like finish with fractions and decimal equivalents embossed on it. DCMT Sales Corp., Div. of British Industries Corp., Dept. MTB, 164 Duane St., New York 13, N.Y.

Use ACTION Card, opposite page 64. Encircle No. 116

WALLS TU-WAY BELT SANDER



Full
1/3 h.p.
G. E. Motor

USE IT
EITHER WAY

VERTICAL

At last, a top quality industrial sander that provides all the most wanted features - yet sells for so little. **\$89.95**

complete with cord, plug, switch ready to use

Illustrated Literature on Request

A few desirable distributor territories still available.

WALLS SALES CORPORATION

333 Nassau Avenue Brooklyn 22, N. Y.

Encircle No. 452 on Card, Opposite Page 65

Self-contained spring with built-in valve

A new Wales Hydra Spring with built-in valve for dampened return to cushion impact has just been announced by the Hydra Spring Div. of the Wales-Strippit Corp., Dept. MTB, 345 Payne Ave., North Tonawanda, N.Y.



Using liquid compressibility called Wales Comproils, this small, self-contained, dual action spring is said to produce up to 3600 lb. force at 1" stroke, and are also available with any spring and dampened return force combination. The unit is 4 3/4" long including 1" stroke and 2 3/4" dia.

Use ACTION Card, opposite page 64. Encircle No. 117

Don't forget to mention
MACHINE and TOOL BLUE BOOK
when writing advertisers, or
use the handy Readers' Service
card opposite page 64.

Special Taps

IN STOCK FOR
IMMEDIATE
SHIPMENT

HIGH SPEED RIGHT HAND TAPS

SIZE	THREAD
4	32-48-60-64
5	30-32-36-48-60
6	36-48-48-56-60
7	32-40-48
8	24-30-36-38-40-44-48
9	24-28-32-40-48
10	28-30-36-40-48-64
12	20-28-32-36-48
14	20-24-28
1/16	60-64
5/64	36-48-72
3/32	48-56-60
7/64	48-56-60
1/8	32-40
5/32	32-36-40-48
9/64	36-46-48
11/64	36
3/16	28-24-32
13/64	32-36-40
7/32	24-26-32
1/4	18-24-26-27-30-32-36-40-48
5/16	16-20-22-27-28-32-36-40
3/8	12-16-18-20-27-28-32-36-40-48
7/16	12-16-18-22-24-27-28-30-32-36-40
1/2	12-14-16-18-22-24-26-27-28-30-32-36-40
9/16	16-20-24-27-28-30-32-40-48
5/8	12-14-16-20-24-27-28-32-36-40
11/16	11-16-18-20-24-27-28-30-32
3/4	9-11-12-14-16-20-24-26-27-28-32
13/16	10-14-16-20-27-32
7/8	10-12-16-18-20-24-27-28-32
15/16	8-9-10-12-14-16-18-20-24-32
1	10-12-16-18-20-24-27-32-40
1-1/16	12-14-16-18-20-24
1-1/8	8-10-14-16-18-20-24-32
1-3/16	8-10-12-14-16-18-20-24
1-1/4	8-10-14-16-18-20-24-32
1-5/16	12-14-16-18-20-24-32
1-3/8	8-10-14-16-18-20-24
1-7/16	8-10-12-16-18-20-24
1-1/2	8-10-14-16-18-20-24-28
1-9/16	16-20-24-30
1-5/8	5 1/2-8-10-12-13-16-18-20-24
1-11/16	10-12-14-16-18-20-24



SIZE	THREAD
1-3/4	8-10-12-14-16-18-20-24
1-13/16	8-10-12-14-16-18-20
1-7/8	8-10-12-14-16-18-20-24
1-15/16	8-10-12-14-16-18-20-24-28
2	4 1/2-8-10-12-16-18-20
2-1/16	12-14
2-1/8	12-16-28
2-3/16	12-16

SIZE	THREAD
2-1/4	4 1/2-8-12-14-16-18
2-5/16	12-18
2-3/8	12-16-18
2-1/2	8-10-12
2-9/16	18
2-5/8	12-16-20
2-3/4	16
2-7/8	8-12-16
3	8-16
3-1/4	8-12-16
3-1/2	8-12-16
3-7/8	6
4	8-12

HIGH SPEED LEFT HAND TAPS

SIZE	THREAD	SIZE	THREAD
0	80	11/16	11-16-24
1	56-64-72	3/4	10-16-18-20
2	56-64	13/16	16
3	56	7/8	9-12-14-16-20
4	32-36-40-48	1	8-12-14-16-18-20
5	40-44	1-1/8	7-12
6	32-36-40	1-1/4	7-12-16-18
8	32-36-40	1-3/8	6-8-10-12-16-18-20
10	24-30-32-40		20-24
12	24-28-32	1-7/16	8-10-12-14-16-18-20
1/4	20-28-32	1-1/2	6-8-10-12-16-18-20
5/16	18-20-24-28-32	1-9/16	8-10-12-16-18-20
3/8	16-24-32	1-5/8	8-10-12-14-16-18-20
7/16	14-20-28	1-11/16	8-10-12-14-16-18-20
1/2	12-13-20-28	1-3/4	8-10-12-14-16-18-20
9/16	12-16-20-24	1-13/16	8-10-12-14-16-18-20
5/8	11-12-18-20-24	1-7/8	8-10-12-14-16-18-20
		1-15/16	8-10-12-14-16-18-20
		2	4 1/2-10-12

LEFT HAND AND SPECIAL DIES IN STOCK

PRICES ON APPLICATION
NEW SIZES ADDED FREQUENTLY

NOTE: Oversize taps. Special size reamers. H. S. extension drills. H.S. Taper length drills No. 1 to No. 60—Letter sizes A. to Z. Fractional sizes 1/8" to 1/2", 12" Overall 9" flute length. H.S.S. aircraft drills 6" and 12" long.

We Specialize in High Speed Cutting Tools
SPECIAL PRICES TO DEALERS

WESTERN TOOL SUPPLY COMPANY

617-19 W. Randolph St., Chicago 6, Ill. PHONE: RAndolph 6-4113

MONTHLY BULLETINS AVAILABLE

Encircle No. 453 on Card, Opposite Page 65

Mechanics Through The Ages

THE GUNS OF **CHICAGO'S** EARLY **FORT DEARBORN** SOLDIERS WERE REPAIRED—AND THEIR HORSES SHOED—BY A BLACKSMITH WHO CAME ALL THE WAY FROM **MILWAUKEE** TO PERFORM THESE SERVICES.



HOG FAT WAS USED TO LUBRICATE MACHINERY IN MANY MIDWEST BACKWOODS SAWMILLS DURING CIVIL WAR DAYS.



BEFORE ATTEMPTING TO PUNCH HOLES IN BRITTLE STEEL, EARLY 19th CENTURY **SCISSORSMITHS** OF ENGLAND, BURIED THE METAL IN **CELLARS** AND LET IT RUST FOR **SEVERAL WEEKS.**



The Secret
is in the

Point!



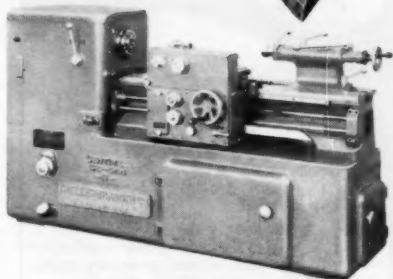
VERSATILITY is the name for Cri-Dan "B"—versatility in all threading operations within the scope of its capacity. (See capacity table.)

The secret of Cri-Dan "B"'s success lies in the single carbide-tipped point that threads with a speed and accuracy no similar threader can match.

A simple facing slide on the rear of the machine enables the Cri-Dan "B" to face as well as thread in one fast operation.

Users tell us that Cri-Dan "B" has solved many tough threading problems *they could not accomplish on ordinary threaders* . . . and saved money to boot!

Ask your Lees-Bradner representative for the facts on threading the modern Cri-Dan way. Then you, too, will get the "point".



Cri-Dan "B" Single Point High-Speed Threading Machine

CAPACITIES

Spindle speed (in 24 steps)	145-2800 RPM
Swing over saddle	4"
Swing over bed	13"
Capacity between centers	36"
Maximum Standard thread length	2½"
Rated capacity	8 TPI-40 TPI
Maximum number of thread starts	6
Maximum Taper Thread	28° incl.

CRI-DAN DIVISION

the **LEES-BRADNER** [®]
CLEVELAND 11, OHIO, U.S.A. *Company*

The MARKET PLACE

Advertisements acceptable in THE MARKET PLACE include those for employment, sales services, production facilities, representation and related needs. Rates: \$20 per column inch per insertion. Maximum size advertisement accepted in this section is three inches.

Copy should reach us by the first of the month for next month's issue.

MACHINE and TOOL BLUE BOOK

A Hitchcock Publication

Wheaton, Ill.



JUMP EDGE FINDER

Locates edge in one minute within .0005



\$2.50 Each
Prepaid orders

Locates edge or step instantly and unmistakably every time within .0005. Complete satisfaction or money back. COD order plus postage.

Dealer Inquiries Invited

ELISHA PENNIMAN
460 South Main St.
WEST HARTFORD 10, CONN.

Encircle No. 455 on Card, Opposite Page 65

\$1.75 HEX-E-CASE

Complete
with 10 wrenches.
Fits all sizes from No. 2 cap. to 3/4-inch set.
Wrenches will not fall out.



AT
YOUR
MILL
SUPPLY

HARTWYK MFG. CO.
BOX B
360 Glenwood Ave., East Orange, N.J.

Encircle No. 456 on Card, Opposite Page 65

THREAD GRINDING

Open Time Available

WARD THREAD GRINDING CO.

265 Howard Ave. Bridgeport 5, Conn.

Encircle No. 457 on Card, Opposite Page 65

"KNOW HOW & SHOW HOW" Machine Tool Reconditioning and the Art of Hand Scraping

Illustrated

Write today for folder describing book

Machine Tool Publications
215 Commerce Bldg. East 4th St.
St. Paul 1, Minn.

Encircle No. 458 on Card, Opposite Page 65

ACETATE SHEETS

UP TO 1/4" THICK

Sheet sizes
20" x 50"

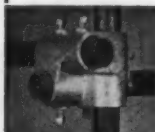
INDUSTRIAL PRODUCTS SUPPLIERS

201 S. Dean St., Englewood, N. J.

*Ideal for Machine Guards
Windows
Safety Shields
Blue Print
Covers*

Encircle No. 459 on Card, Opposite Page 65

Make your own Storage & Pallet Racks



with Amidon Fittings
and one inch pipe.

Amidon Engineering Co.
ELYRIA 10, OHIO

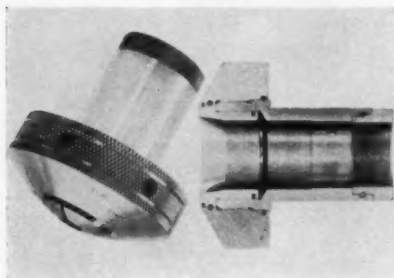
Encircle No. 460 on Card, Opposite Page 65

MACHINE and TOOL BLUE BOOK

Ball-bearing collet chuck

A ball-bearing actuated collet chuck is claimed to locate workpieces axially and radially to within .0005 of an inch even though the workpiece diameters may vary several thousandths.

The new Chukollet, as it is called, is supplied with an adjustable internal



stop, and is claimed to hold short pieces, thin-walled cylindrical parts, and soft-threaded parts without damage.

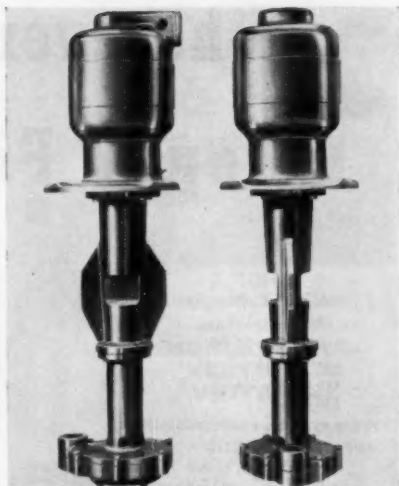
The Chukollet can also be used to hold round, square and hexagonal workpieces for milling, slotting, drilling, tapping, counter-boring and grinding. By using a small v block it may also be used in any machine vise. Hancock Mfg. Co., Inc., Dept. B, Santa Clara, Cal.

Use ACTION Card, opposite page 64. Encircle No. 97

New model gusher pump

Gusher pump Model TL-15025K, arranged for center coolant trough mounting on traveling base machine tool installation, has tapered tubular housing provided with a reinforced narrow section for passage through the limited width slot in the trough cover.

This pump is equipped with one piece electronically balanced shaft assembly which rotates on two heavy-duty precision ball bearings, one of which is located within the top motor and ball housing and the other in the tubular portion of the bracket flange housing. Liquids contaminated by dirt, grit and abrasives can be safely handled without injury to the pump, which is pro-



vided with sufficient clearances to permit free passage of such liquids. Motor is available in 1/2, 3/4 and 1 hp sizes. Ruthman Machinery Co., Dept. B, 1816 Reading Rd., Cincinnati 2, Ohio.

Use ACTION Card, opposite page 64. Encircle No. 98



A micrometer stop, which is claimed to eliminate the use of indicators, feelers, gages, and which can be applied to any screw that needs micrometer adjustment, has been introduced by M. L. Parker Mfg. Co., Dept. B, 19959 James Couzens Hwy., Detroit 35, Mich. The unit adjusts to .001". Available for any pitch or diameter needed, it fits on present stop screw and is fastened by a set screw.

Use ACTION Card, opposite page 64. Encircle No. 99

Whatever You Need, You'll Find It Here

P R O D U C T S I N D E X

A

Abrasive Cloth, Paper, Discs, Wheels, Stones,
Belts, etc, 135
Acetate Sheets, 284
Adapters, 14
Air Hoists, 244
Alloys, 90
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B

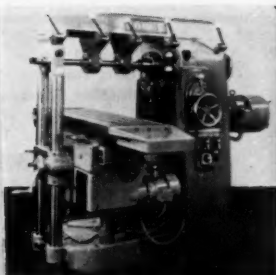
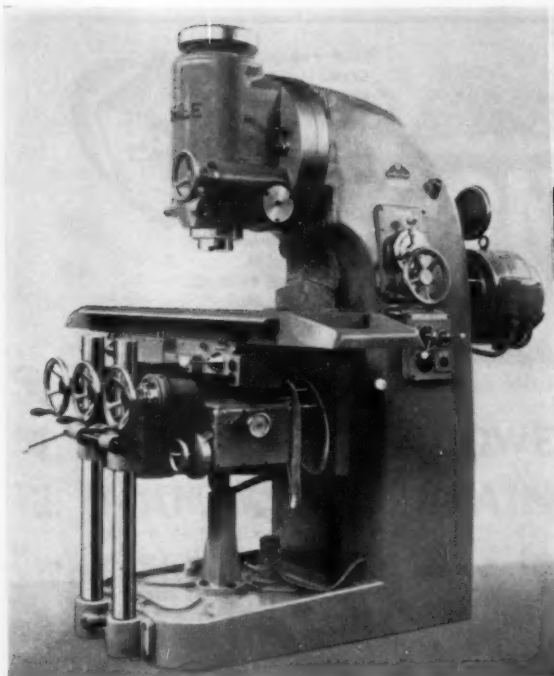
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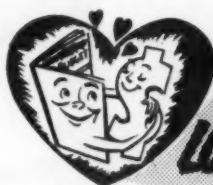
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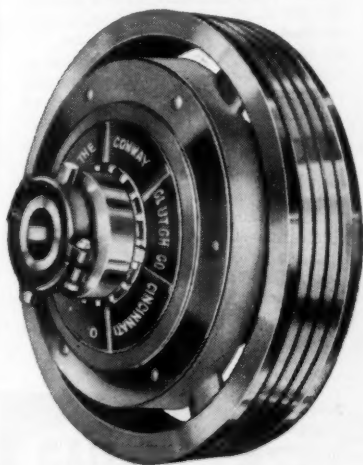
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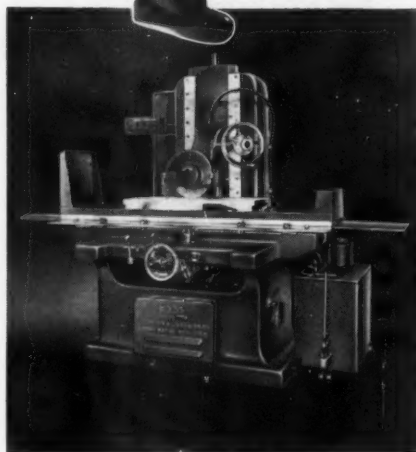
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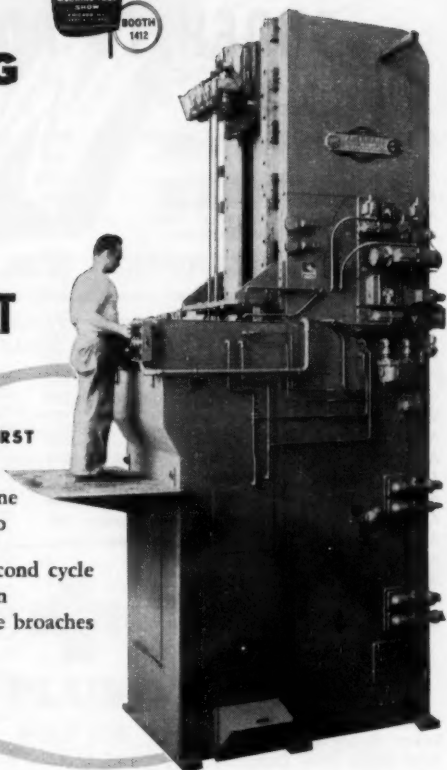
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